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ABSTRACT

Resulting from a project involving district, state, and federal educational agencies, the papers in this, the first of two volumes, are intended to provide information from research and practice that can help school districts in their efforts to make decisions about goals and methods of basic skills instruction. The topics of the papers in the volume were chosen in response to three major concerns: Should basic skills be thought of as minimal competencies? Should they be taught in isolation from each other and from the rest of the curriculum or integrated in some way? and, What can be done to help assure that an emphasis on basic skills instruction will lead to improvements in educational practice and student outcomes? Specific topics covered in the 18 papers include (1) classroom management, (2) integrating the basic skills through the content areas, (3) putting the basic skills in context, (4) state leadership in basic skills, (5) learning in real-life contexts, (6) the nature of "basics," (7) basic skills for the world of work, (8) skills for the future, (9) planning and management of instruction, (10) making choices in basic skills instruction, (11) characteristics of successful basic skills programs, and (12) skill definition in state competency testing programs. (FL)

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1 Basic Skills Issues and Choices

Issues in Basic Skills Planning and Instruction

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Preface

This two-volume collection is the result of cooperation among federal education programs and many researchers and practitioners recognized as experts in basic skills instruction. The papers describe choices and issues to be considered in reviewing current basic skills programs or planning for program improvements. They have been prepared on the assumption that, in planning and reviewing of basic skills programs, it is helpful to know what the choices are, what the important differences among the choices are, and how those differences will influence the outcomes of instruction in a given situation.

We believe a parallel exists between our experience in this project and the experience of many school districts in reviewing, planning, and implementing improvements in basic skills programs. Three important approaches used in preparing this collection were (1) the cooperation among programs responsible for research and programs responsible for school improvement and, more generally, among researchers and practitioners, (2) the open presentation and discussion of conflicting views, leading to a position which respects the strongest points of competing views, and (3) the continuing development and refinement of ideas based on new knowledge and experience.

We suggest that these same approaches are needed in planning at the district level. Thus, in any district there are experts in the schools and in the district office who have important knowledge to contribute to planning for basic skills instruction. Parents and other community members also have important perspectives to contribute. In addition, in most districts there are also college or university personnel who might bring essential perspectives to the process. Basic skills planning must be done in an atmosphere that encourages input from all of these people and that allows time to build understanding and consensus among participants with differing or opposing perspectives.

We commend this collection to you as a resource which we believe can be a helpful tool in the review of current basic skills instruction or planning for improvements in instruction. We invite your responses on how it is useful, or on how it might have been made more useful.

Shirley Jackson
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Acknowledgments

These papers are the result of collaboration among many educators, including educational researchers and staff of federal, state, and district educational agencies. Approximately two hundred people have been involved in the planning of the project, preparation of the papers, review of the papers, and preparation of the introduction. We want to acknowledge our appreciation to the following individuals and groups for their good ideas, hard work, and cooperative spirit.

- All of the consultants from school districts and universities who worked intensively with us in different phases of the project. These included representatives from each of the basic skills areas who met with us in July 1979; members of the planning group which met in September 1979; the educators and researchers who met to synthesize the issues and choices in late September 1979; the reviewers for each of the basic skills areas, who worked with us in February 1980; and the reviewers for the introduction.
- The more than 100 people who provided written or telephone reviews of the papers in this collection.
- People who were interviewed to help us determine the questions to be considered, including staff of appropriate House and Senate committees, members of the Department of Education's Basic Skills Coordinating Committee, staff members of the National Institute of Education, staff members in several State Departments of Education, and parents and professionals from several school districts.
- The American Federation of Teachers (AFT) and the National Education Association (NEA), for their assistance in reviewing the project plan and in identifying teachers to participate in the three-day synthesis meeting.
- Staff of the Basic Skills Improvement Program, especially Shirley Jackson, Lorraine Mercier, Helen O'Leary, and Ann Drennan. These people helped us determine the issues to be addressed, provided critiques and suggestions along the way, and were instrumental in the final preparation and publication of the papers. Our special thanks to Lorraine Mercier, Program Officer for the project, who exhibited patience and a dedication to the project above and beyond the call of duty.
- Sandy Robinson and Tom Sticht, who played crucial roles in initiating the basic skills focus of this collection of papers.
- Joann Kinney, who, as a member of the Reading and Language Studies Team of NIE's Program on Teaching and Learning, helped to keep the project responsive to concerns of other NIE staff.
- Ed Myers, Director of CEMREL's School Improvement Group, whose contributions and constructive criticism during the writing of the introduction were invaluable.
- Michael Kane, Assistant Director for Research and Educational Practice, NIE, who gave support and encouragement.

S.W. /L.J.R.

Foreword

The purpose of this collection of papers is to provide information from research and practice which can help school districts in their efforts to make decisions about goals and methods of basic skills instruction.* The papers include descriptions of different approaches to instruction in each of the basic skills areas — writing, speaking and listening, mathematics, and reading — and discussions of issues to be considered in deciding on the best mix of the different approaches for a particular school or school district. Generally, the papers reflect an expanded view of the basic skills, rather than a minimum competence view.

The collection is intended to be useful to professionals involved in basic skills planning for classrooms, schools, and school districts, but we have assumed that it will also be of use to state and federal policy makers, to people involved in preservice and inservice education, and to researchers.

Often basic skills planning is done with too little time, limited involvement of professionals and community members, and in the absence of adequate information and knowledge. The papers included in this collection are intended to provide or give references to much of the knowledge relevant to reviewing and planning basic skills programs. We hope that this knowledge base will serve as a resource for school districts and will also encourage them to extend the time provided for basic skills planning and the range of involvement in that planning.

The collection grew out of the needs of the Basic Skills Improvement Program and the National Institute of Education. The Basic Skills Improvement Program staff were then responsible for coordination of basic skills activities in more than twenty federally supported programs and for facilitating coordination for basic skills improvement in states and school districts. In order to do that effectively, staff of the program felt that they needed to have a clearer understanding of the approaches and issues to be considered in basic skills planning. The National Institute of Education is responsible for support of educational research and for making knowledge resulting from research available to practitioners in useful forms. Thus, the needs of the Basic Skills Improvement Program for information meshed with the National Institute of Education's responsibility to make knowledge available in a useful form.

Over the last two years, planning and management of the project has been a cooperative venture among Basic Skills Improvement Program staff and staff members in two programs within the National Institute of Education: the Dissemination and Improvement of Practice Program and the Teaching and Learning Program. In the last year, staff of the Research and Development Interpretation Service at CEMREL, Inc., a regional educational laboratory located in St. Louis, Missouri, have become involved in

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*For persons interested in more detail about this project, Spencer Ward has described the procedure used and some of the complications in "An Exploratory Study of a Consensus-Building Approach to Knowledge Synthesis and Interpretation," which will be available in 1982 in *Knowledge Structure and Use: Theory and Practice of Synthesis and Interpretation*, edited by Spencer Ward and Linda Reed and sponsored by the National Institute of Education.

the project. In addition, eighty researchers and practitioners were involved in writing papers, project planning, and analysis of issues. Another two hundred practitioners, policy makers, and researchers helped to identify questions to be addressed or provided reactions to one or more of the papers.

We have considered this to be a synthesis project. Although that term is little used in the volumes, we wanted to highlight here that aspect of the project. Educational research and development have produced much new knowledge in the past twenty years. That research has often not been helpful in improving education. One of the reasons for this failure appears to be that new knowledge is often not organized so the many pieces of knowledge relate to one another and to planning and instruction in schools.

To organize the knowledge, project staff decided to use a modification of a method used by the R&D Interpretation Service for the development of the products in its *Research Within Reach* series. Those products organize knowledge about reading and mathematics instruction around questions asked by teachers. In the present project, we chose to organize knowledge around the questions asked during interviews with thirty state, federal, and district policy makers, and with a smaller sample of parents and teachers.

The interviews were conducted during the period when the Basic Skills Improvement Program was soliciting proposals for a grants competition among local school districts and plans for basic skills coordination from the state departments of education. It was not surprising, therefore, that many of the people who were interviewed expressed concerns or fears about how the basic skills might be misinterpreted as a result of the language in the Basic Skills Improvement Act, rather than asking questions. Some of those interviewed feared that basic skills would be seen as too narrow, thus excluding many of the skills that contribute to successful — rather than just adequate — functioning in our society. Others believed that basic skills *should* be narrowly interpreted.

Based on the interview responses, three related problems were identified: first, there is widespread disagreement on the goals and methods of basic skills instruction; second, there is not a clear understanding of the different approaches to basic skills instruction, so there is no basis for thoughtful choice among different perspectives; and, finally, there exists an inaccurate perception of the basic skills legislation as emphasizing individual skills taught in isolation from other content. The interviews also revealed concerns about the relationships among the four basic skills areas and other parts of the curriculum.

After discussing the interview findings with a number of consultants, we chose to address two questions in the project: (1) What issues should be considered in planning basic skills programs? and (2) What are the choices in planning basic skills instruction? Our initial goal was to present the major issues and choices and to avoid advocating any particular approach. Our plan was to find people to prepare papers analyzing different approaches to basic skills instruction and the issues to be considered in developing a basic skills program, and then to have a group of researchers and practitioners use the papers as a resource for making sense of the various issues and choices, much as we hope school districts will do with the published document.

We wanted to present descriptions and rationales for different choices in the basic skills, representing the different opinions we heard in the interviews. We chose to have different writers prepare brief descriptions — a difficult task in itself — of what we perceived to be the three different approaches to instruction in each of the four basic skills — a subskills approach, a holistic approach, and a balanced approach (a blending of the first two). We also identified people with special interests in such areas as coordination of instruction, classroom management, assessment, and program planning and asked them to write about those issues as they related to basic skills planning and instruction.

Most of the "issues" papers worked out as planned. Several topics, however, proved to be too complicated to deal with in a short paper without being more confusing than helpful. These papers — focusing on motivation, preschool education, adult education, and bilingual education — were removed from the collection.

The "choices" papers — and the choices themselves — proved to be far more complex than we had anticipated. Only in the area of reading were we able to find experts who would advocate quite different approaches, but it was not a clear split between a subskills approach and a holistic or meaning-focus approach. All of the papers on reading emphasized the importance of instruction in comprehension. In the areas of written communication, oral communication, and mathematics, however, we were not able to find widely respected advocates of opposing approaches. Although the authors agreed to place an emphasis on one approach or the other, they would not agree to encourage an exclusively subskills or holistic approach. Many argued that, in fact, this dichotomy did not reflect the issues in these areas of the basic skills.

The approach used involved ongoing review and revision of the papers, with each round taking into account the comments and suggestions of a variety of reviewers. In addition to this consensus-building approach to the papers, we used a strategy of identifying the most important assumptions behind opposing positions and testing them by open critique.** This second strategy involved a group of thirty-five researchers and practitioners who worked with us for three days to make sense of the choices and issues. This group was responsible, ultimately, for a major shift in our thinking about the choices that teachers have available to them as they plan basic skills instruction.

The group suggested strongly that the important question for school districts is not "Which approach is the best approach?" but "How can the teacher, school, or school district create a basic skills program that will take advantage of the strengths and avoid the weaknesses of each approach?" In other words, "How can a school create the richest mix of approaches?" We began to move away from our emphasis on choosing between a narrow (subskills) and a broader (holistic) definition of the basic skills and toward an emphasis on finding the richest mix of the two, a mix which is responsive to the needs and concerns of the students, teachers, and parents. The introduction to the two volumes reflects that shift in our thinking.

We have found this experience with collaboration to be a challenging venture and a personally and professionally rewarding one. We hope the ideas presented here will lead to further cooperation among practitioners, policy makers, and researchers at the federal, state, and district levels. This project has also impressed us with the need for a possible new direction in research on basic skills, research that looks at the ways in which educators create mixes of various approaches in order to meet the needs of individual children in a variety of situations.

Spencer Ward
National Institute of Education

Linda Reed
CEMREL, Inc.

**The consensus-building and assumptions-testing techniques used in this project were adapted from previous work done by Edward Glaser and Ian Mitroff, who consulted with us in planning the project.

Basic Skills Issues and Choices: An Introduction

The papers in these volumes are intended to provide knowledge from researchers, school administrators, and teachers to help with planning for and carrying out basic skills instruction. As described in the Preface and Foreword, *Issues and Choices* has resulted from a project involving district, state, and federal educational agencies. The topics of papers were chosen in response to three major concerns: (1) Should basic skills be thought of as minimal competencies or as something more than that? (2) Should basic skills be taught in isolation from each other and from the rest of the curriculum or integrated in some way? (3) What can be done to help assure that an emphasis on basic skills instruction will lead to improvements in educational practice and student outcomes?

In planning any basic skills program, decisions must be made about what will be taught, how it will be taught, and how the students' learning will be assessed. In most planning situations professionals, parents, and others involved in planning have limited time to spend reviewing research and gathering opinions which would help in making these decisions. This collection of papers is intended to complement basic skills planning at school building, district, and state levels by providing summaries of major ideas which should be considered in planning.

One of the frequent problems in educational planning is that the people involved in planning have different interests and even different words for describing what students should learn, how they should be taught, and what the problems are with current basic skills instruction. This book attempts to identify major issues and choices facing planners, thus providing common terms and a common background for people involved in planning for basic skills improvement.

The improvement of basic skills instruction requires clear and agreed upon goals, instructional procedures, and measures of student accomplishments. Chapters in the three sections in Volume 1 address general issues related to instructional procedures and arrangements, goals, and the planning process. Papers in each of the four sections in Volume 2 highlight different approaches to the specific basic skills areas — writing, speaking and listening, mathematics, and reading.

The editors' notes preceding each section and paper indicate major topics of the papers and how they relate to one another and to the basic skills planning process. The rest of this introduction provides a larger view of how the papers relate to basic skills planning. This discussion is based on our analysis of the papers and on recommendations from a group of thirty-five administrators, teachers, and researchers who worked with us in a three-day meeting and in many telephone contacts to make sense of the issues and approaches described in the papers. In the next four parts of the introduction we will indicate how the papers relate to: (1) the planning process; (2) questions about basic skills instruction; (3) answering the questions; and (4) approaches to basic skills instruction in each of the four basic skills areas. The final section of the introduction will briefly summarize each of the papers.

The Planning Process

The planning of basic skills programs and of all instruction in schools is best seen as an ongoing process. Just as teachers need regularly to assess their students' progress, so schools and school districts need regularly to assess their basic skills instructional programs.

Planning should not necessarily assume that a new program or new approach to instruction is needed. In many situations the best approach to improvement is providing help to teachers in carrying out a current program. The too frequent approach of initiating a "new" program every few years discourages teachers, who often are not involved in making the decision. As Jay Samuels notes in "Characteristics of Successful School Programs in Basic Skills," implementing a new program requires about six years and significant training and support. Effective leadership and teacher involvement, Samuels points out, are critical to both the planning and the change processes.

Although there are urgent needs for improving basic skills instruction, evidence suggests that we are not facing an emergency which would justify throwing out what we have been doing. In "Literacy Is Rising, But So Is Demand for Literacy," John Bormuth suggests that there is no evidence that reading scores in America are declining for the population as a whole, but evidence does point to the fact that literacy is increasingly important for success in our society. He argues that schools must give close attention to the goal of providing effective literacy instruction for all students.

These and other issues in the planning process are the focus of three of the papers, although all of the papers contribute to planning. In "Making Choices in Basic Skills Instruction: Research and Theory," Michael Kamil discusses the role of educational research and theory in basic skills planning. The chapter by Gerald Duffy, "Making Basic Skills Choices: Values and Constraints," examines the values and practical constraints which operate on the planner and the school, as decisions about basic skills instruction are made. Charles Allen offers a firsthand perspective on some of the complications that can occur in planning in "At the Barricades: A Cautionary Tale." Allen describes a curriculum planning effort in response to a state mandate that students meet minimum requirements before graduation.

In discussing the planning process we will consider *goals*, or expected student outcomes; *instruction*, or what happens in the classroom; and *assessment*, or measuring of student outcomes.

A crucial factor in planning is understanding the relationship among goals, instruction, and assessment. At first glance the relationship appears obvious: goals are established, instruction is aimed at reaching those goals, and the assessment reflects the degree to which the instruction has been effective in reaching the goals. Unfortunately, these relationships are often confused. The processes of goal setting, instructional planning, and assessment planning may be isolated and uncoordinated. School district goals may be expressed in vague or general terms that offer little guidance for instruction, or testing programs may be unrelated to the goals of the school or to the instruction that is provided.

An equally unfortunate situation is where standardized tests are used without careful thinking about the adequacy of the range of skills tested. In such a situation the tests may also determine the goals and instructional procedures used without professionals and parents ever carefully examining what students need to learn for effective functioning in the community. As Gorth and Perkins discuss in their chapter, many states are establishing tests to be used throughout the state. Often state assessments are focused around a minimal set of skills. Although this can serve a useful function for the state, it can have negative impacts at the school and district level if parents and professionals accept the state competencies and tests without asking whether students in the individual community or district need additional skills.

The matching of goals, instruction, and performance is critical for the development of effective basic skills programs. When schools are criticized as being ineffective, often there may only be mismatching of these three elements. Although it is unlikely that the goals of the school or its instruction have remained constant during the last 15 years, we know that the standardized tests of student performance have not been adapted to reflect changes either in curricula or in individual courses taken by students. What might be considered a failure to teach may be the teaching of different things. No amount of planning for curriculum change will be seen as effective if the tests designed to measure the results do not match goals and instruction.

Goals are often stated in general terms. Ideally they are related to objectives, which in turn are related directly to instruction. Where goals are not linked to objectives and translated into specific terms, one cannot be sure if the goals are being accomplished. Without the translation to specifics, different people can interpret the goals in their own ways and potentially expect quite different outcomes from instruction. Within a community, if there is disagreement about the goals of a basic skills program, it is unlikely that there will be agreement about the program's success.

Coordination and interaction among goal setting and planning for instruction and assessment are important because the terminology used to state goals is often open to many interpretations until the implications of those goals for instruction and assessment are defined. Interactive planning among those affected provides the option for changing goal statements when it is seen how they translate into practice.

Pat Weiler in "Planning and Management of Instruction" discusses some of these same issues as they relate to planning at the classroom level — including the effective involvement of parents.

Questions about Basic Skills Instruction

In attempting to make sense of issues and choices in basic skills instruction, the thirty-five consultants suggested a number of dimensions on which approaches to instruction differ. We have adapted their suggestions into ten questions which fall into the broad categories of goals, instruction, and assessment. The ten questions are selected to highlight important aspects of basic skills instruction.

Goals	1. What are the skills taught?
Instruction	2. What is the order in which instruction takes place?
	3. How are skills taught and practiced?
	4. What kinds of learning experiences do students have?
	5. What is the setting in which learning takes place?
	6. How is the learning situation structured?
	7. How do teachers respond to students' creativity?
	8. How are student "errors" viewed?
	9. How is instruction in various skill areas or content areas coordinated or integrated?
Assessment	10. How is learning assessed?

Goals

What are the skills taught? The approaches available for consideration here relate to the number of different skills taught, as well as the types of skills. In mathematics and oral communication one approach would be limited to one or a few categories of skills (for example, those skills involved in computation or in public speaking) and another approach would include many additional categories of skills. Types of skills might be distinguished (1) as subskills (isolated skills) or holistic (meaning-focused or problem-solving skills) and (2) as school skills (academic skills) or non-school skills (life skills).

Some of the factors to be considered in setting goals or deciding on skills to be taught are discussed in four of the chapters. Robert Stump and Nina Selz in "Basic Skills for the World of Work" report on surveys of and discussions with school staff, employers, parents and students about what skills are needed in the world of work. In "Skills for the Future," Lena Lupica suggests that rapid changes in cultural, ethnic, and language standards, in the composition of the nation's work force, and in the use of technology require a broader definition of the goals of basic skills instruction if students are to survive in their constantly changing communities. William Gorth and Marcy Perkins describe how five states have identified and defined minimum competencies in the basic skills in response to legislative mandates in "Skill Definition in State Competency Testing Programs." Georgine Loacker and Marcia Mentkowski describe the results of a ten-year effort by a college faculty to more carefully describe and measure the knowledge and skills they wished their students to learn in "A Holistic View of Adult Abilities."

Instruction

What is the order in which instruction takes place? Some educators would propose a set and inflexible order while others would provide much flexibility. Textbooks and district curriculum guides often have a major influence on the skills to be taught and the order in which they will be taught.

How are skills taught and practiced? Skills may be taught and practiced in isolation or in the context of solving a problem or communicating a message.

What kinds of learning experiences do students have? Examples include learning by simple repetition or learning by solving problems or performing a task. More active settings might include student involvement in school and classroom governance and upkeep.

What is the setting in which learning takes place? Distinctions include learning only in school settings and learning in non-school settings, as discussed by Betty Beck in "Learning in Real-Life Contexts."

How is the learning situation structured? Formal (highly structured) or informal (more dependent on student initiative) structures are compared, as are individual and group work. In "Classroom Management: Making Time to Learn Basic Skills," Linda Anderson discusses the research on classroom management and offers concrete examples of effective and ineffective techniques used by teachers.

How do teachers respond to students' creativity? Creativity may be encouraged or discouraged, either directly or indirectly, in the course of teaching any of the basic skills.

How are student "errors" viewed? Another distinction is between an emphasis on correcting "errors" or using student responses as clues to the students' reasoning processes. Regardless of the emphasis on errors, consultants agreed that correction should be made in a way that is not destructive to the child's self-esteem.

How is instruction in various skill areas and content areas coordinated or integrated? Each basic skills area may be taught in isolation so that it receives focused attention from the learner, or in conjunction with other curriculum, so relationships with other curriculum content are seen and so that more than one subject may be taught through a single learning experience.

Most of the papers in the "Issues in Basic Skills Instruction" section relate to the question on coordination or integration of instruction. They deal with the interrelationships among the basic skills, the relationships of basic skills instruction to other areas of the curriculum, and the relationship of basic skills instruction to dealing with non-school situations. Those papers are important in suggesting how the entire school experience can contribute to learning and reinforcing the basic skills, thus increasing the effectiveness and meaningfulness of basic skills instruction and learning.

Dorothy Strickland, in "Integrating the Basic Skills through the Content Areas," describes a framework for integrating the basic skills, both among the basic skills and with other areas of the curriculum. The collaborative effort by a number of professional organizations to encourage an expanded view of the basics is described by Marjorie Farmer in "The Essentials of Education: A Broader View of the Basics." John Meehan, in "State Leadership in Basic Skills," and James MacLean, in "Forward to the Basics — Ontario Style," describe the planning and implementation of programs developed at the state or province level, programs which emphasized integration of instruction across the basic skills.

The use of real-life problem solving is the focus of Betty Beck's chapter "Learning in Real-Life Contexts." In "What's Basic: A Constructivist View," Tom O'Brien provides a theoretical framework for basic skills instruction. That framework emphasizes the child's use of the basic skills to make sense of the world. O'Brien suggests that learning basic skills be integrated with the larger tasks of learning to cope with and understanding the world.

Assessment

How is learning assessed? This question includes issues of frequency and formality of assessment. Decisions about how to monitor students' progress have an important impact on instruction and student learning.

In "Classroom Monitoring and Assessment" Vito Perrone and Walter Haney discuss the importance of both informal and formal procedures — including record-keeping and norm-referenced and criterion-referenced testing — for determining the progress students have made and for communicating effectively with parents. Assessment is also often thought of as formative or summative. Formative, or ongoing, assessment is used every day in the classroom to monitor learning and to make adjustments in instruction as necessary. Summative, or final, assessment is done periodically to assess the overall instructional program.

Answering the Questions

The next section of the introduction will discuss each of the basic skills areas and use charts to outline significantly different approaches to instruction. As background for use of that information, we will provide here an orientation on how to use the charts in answering the ten questions as part of planning basic skills programs.

The charts indicate alternative answers to each of the ten questions as seen from two or three approaches. The approaches help to clarify selected components of instruction and should help to focus basic skills planning discussions. Three points should be emphasized before we discuss how to use the charts.

First, although the charts characterize different "approaches" to instruction, we do not consider any of these approaches to be exact descriptions of what teachers do in the classroom. The charts are, instead, designed to highlight different responses to each question. The responses given are not the only responses possible.

Second, most of the project consultants, particularly administrators and teachers, emphasized that instruction usually consists of a mix of several approaches — a mix that may vary, depending upon the teacher, the student, and the community. The mix will also vary because of different state requirements, different community needs, different available teaching skills, and differences in students.

Among the participants in the project were several highly respected teachers identified by the two teacher unions and several administrators chosen by professional associations and state departments of education. They emphasized that educators in schools do not care about choosing a subskills, a holistic, or any other set approach. They suggested that most teachers use elements of each approach and that the important issues are how to design instruction that is effective and that meets the needs of the individual child and how to maintain the flexibility to respond to changes in children's needs. They agreed, however, that teachers may emphasize or use more of one approach than another.

The third point is that students may need to be exposed to more than one approach to instruction. The papers by Peterson and Resnick suggest that different approaches to instruction lead to different outcomes, and the papers by Stump and Selz, Loacker and Mentkowski, and Lupica suggest that students need the outcomes from the two or three different approaches. In addition, some students learn better when they are exposed to more than one approach, and some teachers teach better using one or another approach.

Most of the teachers, administrators, and researchers who met with us for three days to discuss these issues agreed with the idea that schools should be encouraged to use a rich mix rather than a pure form of any approach. They were not necessarily saying that they thought a rich mix was the "best" instruction. They were saying, however, that, given the realities of the range of beliefs among parents and among professions, a rich mix was the preferred goal in basic skills planning.

Such a mix would include availability in a school, if not in a classroom, of learning experiences representing several approaches to basic skills instruction. Several consultants warned however, against allowing the mix to become random and against activities associated with any approach being done carelessly or in such a way that the basic assumptions behind the approach would be violated.

The brief statements in the next section and the chart on each basic skills area are not definitive statements. They are, rather, attempts at highlighting ideas in the papers. The charts are offered as tools which might aid in identifying strengths, weaknesses, and places for potential improvement in instruction.

Within each basic skills area the ten questions on the chart provide a focus for examining current instruction, identifying areas in which instruction might be improved, and determining how to achieve the improvements. In reading the charts planners might ask — for each question — What are the strengths and weaknesses of each approach? and, What is being overemphasized or underemphasized in our program? This would alert them to strengths to be preserved and potential problems to be corrected. With that information, planners can determine how to achieve necessary improvements.

Brief overviews of each of the basic skills areas follow. In writing, we have outlined the characteristics of product-oriented instruction and process-oriented instruction. In oral communication, we have outlined the traditional approach, a minimum competencies approach, and a functional approach. In mathematics, we have outlined an approach in which the focus is on having children learn computational skills and another in which the focus is on helping children to develop their ability to solve problems in ten different mathematics areas. Finally, in reading, we have presented a subskills approach and a holistic, or meaning-focused, approach.

Writing

When most people think of the word "writing," they think of a piece of paper with words, phrases, sentences, or paragraphs written on it. "Good writing" usually means writing that reflects generally agreed-upon rules of grammar, usage, spelling, vocabulary, and even handwriting. Actually, this is the way that educators have traditionally thought of writing instruction in the classroom. The goal has been to have students learn about the mechanics of writing in an established sequence. If they master the mechanics and have a reasonable amount of practice, they will eventually become "good writers," though perhaps not poets or novelists. This approach to writing instruction focuses on the *final product* of writing.

Over the past decade a group of researchers and educators has begun to talk about writing as a *set of processes* and to stress the importance of having children learn to write by creating a classroom environment which encourages risk taking, lots of writing, and building on young children's already extensive knowledge of language. Proponents of the processes approach to teaching writing suggest that children be taught to use four stages in their writing — prewriting, drafting, revising, and editing.

Prewriting is a period when children generate ideas, organize their thoughts about specific ideas, talk to other children and to adults about their ideas, decide why they want to write (determine their purpose), decide who they want to write for, and generally build their motivation to write. In the drafting stage, they put their thoughts on paper; this might be a free-flowing process, or the writing might be done using a mental or written outline.

In the revision stage, the student might make major changes in the writing — adding, deleting, or rewriting large portions, and possibly reorganizing. It is possible that the student may have an important new thought which will require additional thinking and drafting. Changes in tone, focus, or point of view may occur, and the student may give some attention to spelling, grammar, and other mechanical concerns. Revision may occur once, twice, or several times. Some pieces of writing might never please the writer.

The editing stage is the time for students to put the finishing touches on their writing. At this point they pay close attention to vocabulary, grammar, punctuation, capitalization, usage, spelling, and handwriting. After all, the final product is the physical representation of a great deal of time and energy.

In 1978, in response to a request from the U.S. Office of Education, the National Council of Teachers of English (NCTE) developed a statement of "Standards for Basic Skills Writing Programs." The purpose of the Standards is to assist school districts in defining the content of their instructional programs in writing. The Standards recognize the importance of teaching both the processes of writing and the conventions of edited American English. They also urge that sufficient time be devoted to writing during the school day.

An important point made by the Standards is, "Teachers with major responsibility for writing instruction (should) receive continuing education reflecting current knowledge about the teaching of writing." Many teachers may also need to become more frequent writers themselves in order to understand children's reactions to writing processes.

The Standards, a history of their development, and a discussion of their implications for classroom practice can be found in Charles Suhor's paper, "NCTE Statement on Standards for Basic Skills Writing Programs."

What does instruction which focuses on writing as a product look like? Conversely, how can we characterize an instructional program which has writing processes as its primary focus?

Figure 1 describes each kind of approach in relation to the ten questions we have discussed. Again, (1) for any of the questions, a writing program may include major elements of both of the approaches described, as well as of other approaches, and (2) the answers given for the questions represent samples within a range of answers that could be given.

In addition to Charles Suhor's paper, Volume 2 includes three papers which are designed to assist school districts and individual teachers in making decisions about writing instruction. Vivian Davis describes approaches to and practices for the teaching of mechanics in her paper, "Teaching the Mechanical Conventions of Writing." She presents some of the suggestions of educators and researchers about what should be taught, in what sequence, and using what instructional approaches. Research has not established the best way to teach the mechanics of writing. Many approaches are used and are effective.

Two papers focus on teaching writing as a process. In "The Movement toward Meaning-Focused Writing," Robert Brown, Jr., discusses difficulties in writing and teaching writing, how writing differs from conversation (the fact that it does differ makes writing even harder for students to learn), and how teachers can succeed in the classroom in spite of all the difficulties inherent in the learning and teaching processes.

Thomas Newkirk, in "The Writer as Experimenter," describes the phases a child goes through as he or she learns to write — from drawing and writing using invented spelling to a mature phase in which writing represents informed commitment. Suggestions for guiding students through the prewriting, drafting, revising, and editing stages while they are going through the learning process can be found throughout the paper.

Speaking and Listening

Speaking and listening have always been an integral part of the basic skills curriculum. Show and tell, oral reading, responding to teacher questions, oral book reports, reciting of poems or famous speeches, and class plays are familiar to all of us, and they are still present in the language arts curriculum. Yet such activities as oral book reports and class plays are considered special events in most classrooms, and there are not many times each day that a child in a class of twenty-five or thirty children gets to answer a teacher's question.

Most teachers do not teach oral communication as a set of skills necessary for students to function effectively in society, as they do reading, writing, and mathematical skills. Yet children outside of the classroom, and most adults, spend much more time talking and listening during the average day than they do reading, writing, or solving mathematical problems. Good oral communication skills are important, and they *can* be taught.

In 1978, the Educational Policies Board of the Speech Communication Association (SCA) established a task force to recommend minimal speaking and listening competencies for high

Figure 1. Writing Instruction

Questions to be asked by planners for each category:
What is the current practice in our school district? What is overemphasized? What is underemphasized?

Goals	Focus on Products	Other Approaches*	Focus on Processes
What are the skills taught?	Handwriting — children are taught to write with ease, clarity, and enough speed that their handwriting does not restrict their expression of ideas. Spelling — children are taught rules for spelling, the meanings and pronunciations of words they are learning to spell, and they are expected to use the words in their own speech and writing. Capitalization and punctuation rules are usually taught in a predetermined sequence from grades one through six. Grammar and usage — tense, agreement, sentence structure, etc.		Children are taught to understand writing processes and to realize the need for flexibility. This includes prewriting skills, drafting skills, and, later, revising and editing skills. They are taught to read and assess the writing of others, particularly their peers, and to be critics of their own writing. They are taught handwriting, spelling, capitalization, punctuation, and grammar and usage as part of the editing process. Emphasis is on clarity of meaning, so that the intended audience will understand what the writer is trying to say.
Instruction			
What is the order in which instruction takes place?	The sequence in which skills are taught is highly structured, with simple concepts being taught before more difficult concepts. Children are taught to write simple sentences, then complex sentences, paragraphs, and essays. Order in teaching students to write for different purposes is usually from expressive to narrative to persuasive.		Writing instruction emphasizes writing as a set of processes. At all levels instruction treats each part of the writing process. Practice in the techniques of prewriting (for very young children, this might be drawing) and drafting comes first. Later, children are taught techniques for revising and editing. The mechanics of writing are taught as part of the editing process. Emphasis throughout is on purpose for writing and identification of audience.
How are skills taught and practiced?	Formal writing instruction usually begins after children can read. In spelling, children are given a list of words each week. They complete workbook exercises, usually write sentences using the words, and are tested at the end of the week. Instruction in the use of capitalization, punctuation, and grammar usually occurs through formal lessons and written exercises and through analysis of and feedback on student writing. These skills are practiced through completion of workbook exercises and writing assignments.		Children are taught to write by having lots of writing experiences — this begins as early as kindergarten. They are encouraged to verbalize their ideas by talking to the teacher and their classmates. Assignments are broken down into small steps to help the students explore and organize the topic, decide on a purpose for their writing, identify and think about their audience, and adopt a point of view. Students are taught the mechanics of writing as they need to know them, most often during the editing process. The student/teacher conference is used frequently as a teaching and assessment strategy, usually during the revision stage of a piece of writing.

*These lines represent other possible approaches to writing instruction.

Figure 1. Writing Instruction (Continued)

	Focus on Products	Other Approaches	Focus on Processes
What kinds of learning experiences do students have?	Learning by rote, memorizing rules, completing many exercises that illustrate the same rules. Students often select writing topics from lists provided by the teacher. In many classrooms, students receive one formal writing assignment per week. The audience for the writing is usually perceived by the student to be the teacher.		When they enter school, children are already accomplished language learners. Their previous experiences are the basis for early writing activities. The child learns to write by drawing, by talking, by reading, and by being encouraged to write in a warm, positive atmosphere. The teacher serves as guide, facilitator, sounding board, but not always as the audience. Children are encouraged to write for their peers, parents, and other audiences.
What is the setting in which learning takes place?	Primarily in school, using commercially published "grammar books," workbooks, and often teacher-developed worksheets for practice. Attempts to motivate children are made through giving them high-interest topics to write about and through encouraging them to choose their own topics. Samples of student writing are discussed by the whole class and are often displayed in the classroom.		Primarily experience-based, using children's own internal motivation to express themselves. Emphasis is on the students' personal experiences in school and out of school. Open atmosphere that encourages sharing of ideas with the teacher and among students.
How is the learning situation structured?	Highly structured and formal. Most work is either whole class instruction, individual seatwork, or homework.		The teacher serves as guide and facilitator in a relatively informal atmosphere. Skills are learned as the children are motivated to learn them in order to achieve clarity in their writing. Lots of one-to-one (both student/teacher and student/student) interaction and lots of small group sharing and writing.
How do teachers respond to students' creativity?	Although the teaching of the conventions of writing does not usually encourage students to be creative, an effort is made to motivate students and to encourage attempts at creativity, within the constraints of existing rules.		The entire focus of the writing program is to build and maintain students' interest in writing. They are encouraged to be as creative as they can be. The only constraint on their creativity is that their ideas must be clear and their purpose accomplished with the intended audience.
How are student "errors" viewed?	Specific skill deficits are diagnosed by the teacher based on identification of recurrent error patterns. The child is given individualized instruction and additional practice worksheets to help correct the problem. Children with similar error patterns might be helped in small groups.		Errors in student writing are viewed as a natural part of the learning process. Risk taking is encouraged. Most errors will disappear as students mature. Those that do not will require guidance from the teacher for correction. The teacher is more concerned about students' understanding of the process and purpose of writing than about errors in the product. Uses the product as basis of feedback on the process the student used.

Figure 1. Writing Instruction (Continued)

	Focus on Products	Other Approaches	Focus on Processes
How is instruction in various skill areas or content areas coordinated or integrated?	Writing instruction is part of the language arts program in all schools. Although writing is likely to be used in content area courses such as science and social studies, students are not usually graded on their writing ability by teachers of those courses. Writing in these courses is often just a matter of answering lists of questions, although they might also require occasional written reports. Some content-area teachers require the keeping of a journal.		Because it is so important that students do a lot of writing, they are encouraged to write in all of the content areas, for example, to keep journals, to work and write in activity centers, to assist in designing, writing copy for, and building displays in the classroom.
Assessment *How is learning assessed?*	Student grades depend on their performance on spelling tests, completion of workbook exercises, and their performance on tests to assess specific skills, as well as their grades on writing assignments. Evaluation of writing assignments reflects informed judgments about clarity, content, and the conventions of spelling, mechanics, and usage.		Primary attention is given to students' ability to effectively communicate their ideas in relation to their purpose and audience. Student/teacher conferences permit informal ongoing diagnosis and feedback to the student. Evaluation is based on complete pieces of writing and reflects informed judgments, first, about clarity and content and then about conventions of spelling, mechanics, and usage.

school graduates. The list of recommendations, which is included in Fred Jandt's paper, "Oral Communication: Individual Skills Focus," describes the competencies which students must develop in each of three areas: occupational, citizenship, and maintenance. The competencies within each area are categorized in the following way:

1. *Communication codes* — this set of skills deals with minimal abilities in speaking and understanding spoken English and using nonverbal signs (e.g., gestures and facial expressions).
2. *Oral message evaluation* — the use of standards of appraisal to make judgments about oral messages or their effects.
3. *Basic speech communication skills* — the process of selecting message elements and arranging them to produce spoken messages.
4. *Human relations* — skills used for building and maintaining personal relationships and for resolving conflict.

In 1979, SCA went beyond this initial set of guidelines to develop, with the American Speech-Language-Hearing Association, a list of "Standards for Effective Oral Communication Programs." The Standards emphasize the everyday needs of students, the classroom as a practical communication environment, and the expansion of the student's repertoire of speaking and listening behaviors. These Standards are included in Barbara Lieb-Brilhart's paper, "Standards for Effective Oral Communication Programs." Lieb-Brilhart describes the development of the Standards, assumptions upon which they are based, and tensions they may cause in the educational community as school districts begin to implement them.

A pressing problem for educators in oral communication is the assessment of student skills. SCA has provided guidance in the assessment of oral communication skills in the form of the "Criteria for Evaluating Instruments and Procedures for Assessing Speaking and Listening." The criteria appear in Jandt's paper. Among other things, the criteria call for assessment that (1) clearly distinguishes speaking and listening performance from reading and writing ability, (2) emphasizes the application of speaking and listening abilities in familiar situations, (3) involves situations allowing for a range of acceptable responses, (4) is standardized and has content validity, (5) avoids creating undue stress or anxiety, and (6) is free of sexual, cultural, racial, and ethnic stereotyping.

In describing approaches to speaking and listening instruction, we will focus in Figure 2 on a classroom in which an activities approach is found, a classroom where minimal competencies are taught, and a classroom that focuses on functional communication. In oral communication, there have not been clear definitions of these three approaches, and other approaches have been described. Regardless of the approach or mixture of approaches used, all educators need to become strongly committed to the development of oral communication programs.

The institutionalization of such programs will require specific planning. Barbara Lieb-Brilhart warns that

> While assessment may be difficult, it is also important that educators not use this as a reason for leaving oral communication out of the basic skills curriculum. In fact, as oral communication programs are being designed, more state and federal agencies, as well as research organizations, are developing assessment procedures. . . . Test publishers are also participating in the development of suitable instruments. Although these activities are helpful and encouraging, it is important that ease of assessment not determine the content of the curriculum. (p. 44)

School districts planning to implement an instructional program in oral communication based on SCA's speaking and listening competencies will find valuable suggestions in Clarice Lowe's paper, "Application of Minimal Speaking and Listening Competencies." School districts which are considering implementing a functional approach in the classroom will be interested in reading Barbara Wood's paper, "Oral Communication: Holistic Skills/Functional Approach."

Figure 2. Speaking and Listening Instruction

Questions to be asked by planners for each category:
What is the current practice in our school district? What is overemphasized? What is underemphasized?

Goals	**Activities Focus**	**Others***	**Minimal Competencies**	**Others***	**Functional**
What are the skills taught?	The primary goal of the instructional program is to perfect speaking as an art form in formal activities such as public speaking, oral interpretation, debate and drama. Very little formal instruction is given in the elementary grades. Children are taught to speak with ease and clarity at a reasonable rate. As they grow older, they must pay attention to loudness, pitch, and correctness. For oral book reports and speeches, children are taught how to organize their ideas and the steps involved in preparing for informative and persuasive speaking. Few oral interpretation and drama skills are taught, although some children do perform.		Communication codes: listen effectively to spoken English, use words, pronunciation, and grammar appropriate for situation, use nonverbal signs appropriate for situation, use voice effectively. Oral message evaluation: identify main ideas in messages, distinguish facts from opinions, distinguish between informative and persuasive messages, recognize when another does not understand your message. Basic speech communication skills: express ideas clearly and concisely, express and defend with evidence your point of view, organize messages so that others can understand, ask questions to obtain information, answer questions effectively, give concise and accurate directions, summarize messages. Human relations: describe another's viewpoint, describe differences in opinion, express feelings to others, perform social rituals. Occupational, citizenship, and maintenance applications are taught for each of these skills.		Children at all levels are given experiences that allow them to develop their skills in five areas, which are functions of everyday interactions: controlling, sharing feelings, informing, ritualizing (skills, such as taking turns in conversations, which help to sustain our social relationships), and imagining (fantasizing, storytelling, etc.). Children are taught to understand the importance of, respond to, and use nonverbal messages. Children learn how to select strategies from their repertoire of skills, how to implement the strategies, and how to evaluate the results of the communication.
Instruction *What is the order in which instruction takes place?*	Children are encouraged to speak in front of a group in kindergarten and the primary grades to describe an object they would like to share with the		Information is presented so that the student progresses from simple to complex levels of speaking and listening ability. The learning experience pro-		Students at all levels, from preschool through high school, are given practice in using five communication functions (controlling, sharing feelings, informing,

*These lines represent other possible approaches to speaking and listening instruction.

Figure 2. Speaking and Listening Instruction (Continued)

	Activities Focus	Others	Minimal Competencies	Others	Functional
	group. Developing attention span and encouraging children to ask questions begins at this time. Throughout the primary, intermediate, and middle grades, children are given opportunities to perform in front of the class, with minimal formal instruction. During the junior high school years, students may be given basic instruction on developing and delivering speeches. Formal instruction is available to some extent in most high schools, usually through one-semester electives.		vides a link between earlier speaking and listening experiences, with activities designed to build the students' ability to function competently in a wide array of communication contexts. Activities designed to increase students' ability to use communication codes and basic oral communication skills, to evaluate oral messages, and to build and maintain human relations are designed at all grade levels.		ritualizing, and imagining). As students get older and gain in experience, they are encouraged to use a wider variety of strategies from their repertoire, they are expected to refine and to better express their selection criteria, their performances will become more creative, and they will be expected to use more evidence to support their evaluations.
How are skills taught and practiced?	For the most part, children in primary and intermediate grades are asked to perform (show and tell, oral reading, reciting poetry, etc.) without specific instruction. Very young children are encouraged in show and tell through teacher questions. Developing listening skills in young children involves teaching them to attend and encouraging them to ask questions. As children get older, the teacher may give guidelines to the class as a whole. When children begin to give speeches (usually in junior high school), they are given specific instruction in organizing ideas, developing the speech, and oral delivery strategies. Listening skills instruction tends to involve having students listen for specific elements in a performance and then asking them to respond to the performance.		Teachers teach the principles of effective communication directly. Teachers can emphasize either skills practice or behavior that requires the application of the skills, or both. Focus is on expanding students' abilities to understand and cope with their environment. Emphasis on both conceptual and experiential learning. Most skills are taught through activities carried out in groups; the activities are followed by class discussion led by the teacher. The teacher tries to maintain continuity from activity to activity and to give students recurring experiences, so that their learning will be reinforced.		The functional approach involves the use of exercises which (1) focus on one primary communication function; (2) are practical and worthy of students' attention; (3) involve as many students as possible; and (4) through effective discussion/leadership techniques, encourage the students themselves to provide observations on and evaluations of the exercise. The fundamental approach in the classroom is to provide exercises that involve activities that are highly familiar situations for the students, where they can easily imagine what to say and do. Lots of role playing is used.

Figure 2. Speaking and Listening Instruction (Continued)

	Activities Focus	Others	Minimal Competencies	Others	Functional
What kinds of learning experiences do students have?	Primary grades: show and tell, oral reading in unison, listening to teacher read or records. Primary and intermediate grades, middle grades: answering teacher questions or repeating after teacher, reciting in class, paraphrasing and summarizing, oral book reports, class plays, organizing and delivering speeches.		Role playing, discussion and small group activities are at the center of the instructional program. Some public performance.		Learning through a process of selecting oral communication strategies, implementing those strategies, and evaluating the effectiveness of the communication. Role playing, discussion, student/teacher and student/student interaction, and small group activities are at the center of the instructional program.
What is the setting in which learning takes place?	Primarily in school. In the early grades there is frequently a special place in the classroom for show and tell. As children grow older, oral performance tends to occur in front of classmates seated at their desks.		Children's own experiences are expanded upon, but activities are also designed by the teacher to add specific new skills to the students' repertoire. Activities increase in difficulty as students grow older. Activities may take the children into the community, where they learn to interact with a variety of people in a variety of contexts.		Children's experiences outside of school are used to create a functional, meaningful learning base. Activities may often take them outside of the classroom, where they can practice interacting with a variety of people in a variety of contexts.
How is the learning situation structured?	When activities take place, they are highly structured and formal. Show and tell, for example, involves each child speaking in turn while the others listen and then ask questions. Student performances are also formal situations. Because 25-30 students must perform, very little time, if any, is given to large group responses to performances. Small group activities may involve unison reading, preparing for a class play, occasional role playing.		The teacher designs specific activities for students, which allow them to practice existing and new skills, give students recurring experiences, become more challenging as students become more mature, and exhibit a high degree of continuity from activity to activity. Most activities are carried out in small groups, so that maximum interaction can be obtained.		The teacher arranges the environment to encourage as much interaction as possible, designs relevant, appropriate activities, and provides adequate time for feedback from peers and for self-evaluation. There is a great deal of work in dyads (two students) and in small groups.

Figure 2. Speaking and Listening Instruction (Continued)

	Activities Focus	Others	Minimal Competencies	Others	Functional
How do teachers respond to students' creativity?	Students are encouraged to be creative but are given limited opportunities to do so.		Students are encouraged to be creative. A constraint on student creativity is the responsibility to keep in mind the purpose and goal of the communication and the rights and responsibilities of other participants in the communication.		Students are encouraged to be creative. A constraint on student creativity is the responsibility to keep in mind the purpose and goal of the communication and the rights and responsibilities of other participants in the communication.
How are student "errors" viewed?	Student performances before the class are usually uninterrupted. The teacher may then comment on the performance either for the benefit of the whole class or in a student/teacher conference. Occasionally students are asked to practice some more and perform again. Often, students wait until the next assignment to have an opportunity to correct their problems.		Teacher takes the role of guide and facilitator, asking focused questions of individuals and groups. Peer responses and questions are also an important part of the process.		The teacher helps the students evaluate themselves and their peers when something seems to be going wrong in a communication. Students are encouraged to take risks. Though students may benefit from suggestions from the teacher, suggestions of this nature are not often incorporated into the students' communication systems.
How is instruction in various skill areas or content areas coordinated or integrated?	Oral performance, especially oral reading, giving speeches, and dramatic performances, is integrated with reading and writing instruction and occasionally with social studies instruction.		The use of oral communication skills is often directly related to the use of knowledge gained from content area instruction.		The relationship between content area instruction and oral communication instruction is critical throughout the school years. Content area teachers can contribute to the learning of speaking and listening skills by developing activities which relate content and oral communication skills to real-life experiences.
Assessment					
How is learning assessed?	Ongoing informal diagnosis by the teacher. Children are graded on their performances based		Ongoing informal diagnosis by the teacher. Assessment emphasizes the application of		Evaluation of student progress rests in the student/teacher discussion of their observations

Figure 2. Speaking and Listening Instruction (Continued)

Activities Focus	Others	Minimal Competencies	Others	Functional
on the informed judgment of the teacher. As they grow older, children are usually graded through the use of a teacher-developed list of criteria.		speaking and listening skills in familiar situations. Assessment is individualized, involving observations, self-evaluation, listeners' responses to messages, and formal tests.		and analyses of classroom efforts. The teacher's role is to observe and describe communication, summarize communication, and lead discussion about comparisons of communication behaviors. The teacher leads the students into making evaluations of themselves and their peers.

Reading

The century-old controversy among reading researchers centers on the question of whether children should be taught to read using a code-emphasis or a meaning-emphasis instructional approach. Supporters of the code-emphasis theory argue that children learn how to recognize words through symbol-sound correspondences (matching printed symbols to sounds in oral language) and ultimately recognize words with a degree of automaticity which permits them to derive meaning from print.

Those who support a meaning-emphasis instructional strategy argue that reading instruction should focus directly on the functions of language and that the instruction should be related to the child's own background of experience. The breaking of the alphabetic code is a natural outcome of this process.

How do these very different instructional strategies look in the classroom? Figure 3 describes the characteristics of a code-emphasis approach and those of a meaning-emphasis approach.

The code emphasis approach to reading is described in more detail in Douglas Carnine's paper, "Direct Instruction: A Bottom Up Skills Approach to Elementary Reading Instruction." Carnine discusses research evidence on the subskills approach and outlines the ingredients for a successful subskills program.

One version of a meaning-emphasis approach is the whole-language, meaning-centered program described by Ken and Yetta Goodman in "A Whole-Language Comprehension-Centered View of Reading Development." An important contribution of this paper is the authors' discussion of how to move from a basal-reader-centered program to a whole-language approach.

Does Either Reading Instructional Approach Work Better than the Other?

Unlike the other areas of the basic skills, reading instruction has been the subject of debate among researchers and theorists for over a century. Teachers and administrators have decades of experience based on research and classroom practice to help guide the decisions they make about reading instruction in the schools. Much of the evidence we have, however, does not point strongly in one direction or the other.

Lauren Resnick, in "Theories and Prescriptions for Early Reading Instruction," describes the studies that have been undertaken to determine which approach is most effective. She summarizes the evidence from those studies and offers suggestions for classroom practice. Penelope Peterson, in "Direct Instruction Reconsidered," presents evidence that each approach tends to lead to the learning of different and equally important skills.

What Should Schools Do?

Clearly, schools should take action based on their understanding of the students they serve, the needs and preferences of the community, the capabilities of staff, and the school's history of success or failure. In most schools, we would find the use of elements of both approaches. Harry Singer's paper, "An Integration of Instructional Approaches for Teaching Reading and Learning from Text," a description of one such approach, will be useful to curriculum planners who believe that an integrated approach is necessary in order to meet the needs of all students. Singer describes a complete instructional program which is designed to develop reading skills in children while providing language experiences that develop comprehension skills.

Similarly, Resnick describes a strategy called "simultaneous teaching" which can be used to take advantage of the positive elements of both approaches. Simultaneous teaching can involve the early introduction of a rich variety of written materials in a code-emphasis program or the simultaneous teaching, perhaps by different teachers, of an informal, language-experience approach and a structured, code-oriented program.

In "Learning to Learn from Text: A Framework for Improving Classroom Practice," Robert Tierney and David Pearson discuss recent advances in our understanding of how readers comprehend as well as the importance of students learning how to self-regulate their own learning. They present guidelines by which a comprehension-based curriculum can be established and suggest ways teachers can lead students toward independent use of reading

Figure 3. Reading Instruction

Questions to be asked by planners for each category:
What is the current practice in our school district? What is overemphasized? What is underemphasized?

Goals	**Code Emphasis**	**Other Approaches***	**Meaning Emphasis**
What are the skills taught?	Subskills, e.g., sound-symbol correspondences, such as identification of initial and final vowels, consonants, syllables, and morphemes; dividing words into components and then sounding them out; understanding syntactic relationships; building a sight word vocabulary.		As they engage in communicative experiences, students acquire basic understandings of how language functions and is used. At the same time as students are involved in "total" reading experiences from the beginning, they become aware of what they are learning in terms of language conventions and discuss strategies they use as they read, write and experience communication. The teacher's task is to capitalize upon and encourage the students to be their own informants.
Instruction			
What is the order in which instruction takes place?	Letter, sound, and word recognition taught first; comprehension skills become focus after students develop automaticity; preskills of a strategy are taught before the strategy itself is presented; high utility skills are introduced before less useful ones; easy skills are taught before more complex ones. Skilled comprehension strategies are taught beginning in the intermediate grades.		Students are encouraged to be active participants in their reading experiences. Rather than be taught subskills they are provided experiences for understanding a variety of text read for student self-initiated purposes. Students learn strategies and skills in conjunction with these communicative experiences. These experiences can emanate from the students' initial writing experience, from reading activities involving reading predictable texts, simple directions, stories, etc., or from print-related activities related to everyday activities (e.g., grocery lists, responding to signs and notices).
How are skills taught and practiced?	Subskills are taught in a specific sequence and are practiced until they are mastered. Complex skills are broken down into components. The teacher demonstrates the steps in a strategy and then provides structured practice in using the strategy. The students practice until they recognize when the strategy is called for in a situation. Practice includes a concentrated presentation of examples, with review across several lessons. Unison reading; individual oral responding, usually in small groups; game activities.		As children are involved in reading experiences for which they have self-propelled purposes, they are encouraged to consider the strategies they might use or do not use to achieve their reading goals. The teacher's task is to encourage the student to explore these learnings and try them or test them. Thus, skills/strategies are developed in conjunction with meaningful reading and learning experiences.
What kinds of learning experiences do students have?	Learning by practicing the same skill over and over again, gradually moving to more and more complex skills. Most children move through the various levels of a basal reader supplemented by high interest reading materials.		Learning is primarily experience based, using children's problems/purposes to direct selection of texts or using children's own written materials. Within these contexts, learning occurs through student discovery and exploration rather than teacher direction. Practice occurs naturally as students test their strategies in a variety of communication contexts. Practice involves

*These lines represent other possible approaches to reading instruction.

Figure 3. Reading Instruction (Continued)

	Code Emphasis	Other Approaches	Meaning Emphasis
			testing as well as refining what is learned. Students are recognized as accomplished language learners who are apt to learn when experiences are meaningful and goals for learning are self-propelled.
What is the setting in which learning takes place?	Primarily in school, using a commercially published basal reader series and supplementary materials. Many classrooms have a reading corner where high-interest books are available to the children.		Children's experiences outside of school are used to create a functional, meaningful base for learning. Emphasis on taking the children into a variety of settings to build on their experience base. Classroom materials are many, varied, and predictable — they grow out of the children's and teacher's interests.
How is the learning situation structured?	Highly structured, with skills to be learned in a specific order. Some students will not be interested in learning. The teacher can show them that they can succeed in reading by designing lessons effectively, and that there is a reward in learning to read by using extrinsic rewards such as physical contact and by eventually developing intrinsic motivation in these students. Children are divided into small groups based on their ability. More time is generally spent with low-ability groups. Continuing diagnosis allows for restructuring of groups based on needs of students.		The teacher serves as a group facilitator. The teacher arranges the environment, provides relevant, appropriate materials, and provides timely experiences to facilitate learning. The learner extracts from the environment those elements which are most meaningful. When language is functional, motivation to learn is high. Children know when they are successful because they have met their own needs. No external reward system is necessary. Teachers work with children individually and in small groups. Much time is given to self-selected reading. Lessons tend to focus on developing strategies for getting meaning from print.
How do teachers respond to students' creativity?	Student creativity is not a focus of the beginning reading program.		The entire focus of the reading program is to build and maintain students' interest in reading. Students are encouraged to be as creative as they can be.
How are student "errors" viewed?	Specific skill deficits are diagnosed by the teacher based on identification of recurrent error patterns. The correction procedure involves praise for correct responses, modeling the correct response and leading the child (responding with the child), testing the child until he or she responds correctly every time, and giving the child a delayed test later in the lesson.		Self-exploration of problems on the part of students is a critical part of the learning process. Errors are accepted as a natural part of that process. Students' own motivation to learn results in the correction of errors. The teacher serves as a guide and facilitator in this process.

Figure 3. Reading instruction (Continued)

	Code Emphasis	Other Approaches	Meaning Emphasis
How is instruction in various skill areas or content areas coordinated or integrated?	This is highly individualized. It is recommended that teachers of intermediate children incorporate reading activities into all content area instruction; however, strategies for reading content materials are seldom taught.		Content areas are integrated within a problem-solving curriculum. Particular concern is given to the reading of content materials in mathematics, science, and social studies. Students work at the development of special strategies for reading and understanding these materials. Much emphasis is placed on written and oral language use together with reading.
Assessment *How is learning assessed?*	Children are tested, usually with informal reading inventories, at the beginning of the school year to determine their skill levels and to place them in the appropriate small groups. For ongoing evaluation, teachers use individual skills tests and have students read aloud individually.		Teachers observe and monitor the progress children are making in developing literacy. They observe students using language and informally apply their knowledge of language development to achieve an understanding of students' strengths and needs. Teachers evaluate the program on the basis of evidence that children have acquired and use comprehension strategies.

strategies. Their discussion represents important new directions for school reading programs and also programs dealing with any aspect of language learning, that is, oral and written. Recent National Assessment of Educational Progress (NAEP) findings about the decline of higher level skills in adolescence lend weight to this argument.

Mathematics

Instruction in computational skills has always been and continues to be the primary focus of the mathematics curriculum. Over the past several years, however, several mathematics education professional organizations have developed lists of competencies which represent a new school of thought about *basic* mathematics education.

The National Council of Teachers of Mathematics (NCTM), the National Council of Supervisors of Mathematics (NCSM), and the Association of State Supervisors of Mathematics (ASSM) have all issued statements stressing the importance of mathematics in our society and urging schools to teach such skills as problem solving, estimation, measurement, prediction, and computer literacy as an integral part of the mathematics curriculum. Ross Taylor, in his paper, "The Mathematics Education Profession's View of Basic Mathematical Skills," describes the development of the NCTM publication, *An Agenda for Action: Recommendations for School Mathematics of the 1980s;* the NCSM "Position Paper on Basic Mathematical Skills"; and the "Report of the Kansas City Coordinating Conference," which was co-sponsored by NCTM, NCSM, and ASSM.

The NCSM position paper calls for the development of ten skill areas necessary if students are to *effectively* meet the demands of today's society. The skill areas are listed below (notice that computation, which includes the four basic operations using whole numbers and decimals, and simple fractions and percents, is only one of the ten skill areas):

1. Problem solving
2. Applying mathematics to everyday situations
3. Alertness to reasonableness of results
4. Estimation and approximation
5. Appropriate computation skills
6. Geometry
7. Measurement
8. Tables, charts, and graphs
9. Using mathematics to predict
10. Computer literacy

What are the differences between an instructional approach with computation as its primary focus and one which stresses the building of a broader mathematical competence? The questions used in the previous sections will be used in Figure 4 to characterize these two orientations to teaching mathematics. (Authors of the papers were not asked to describe the characteristics of "new" math, so that instructional approach is not dealt with here.)

School districts that decide to expand their mathematics program to include more of the skills recommended by the three professional mathematics education associations will have to provide extensive inservice training. Teacher education in this country often has not prepared teachers to teach many of these skills, and there has never been a strong emphasis in teacher education on developing children's critical thinking abilities. An important part of a plan for a revised curriculum will be a staff development component designed to increase teachers' mathematical knowledge, to decrease their mathematics anxiety, and to offer constructive, practical suggestions for moving from computation-oriented instruction to instruction that has a problem-solving orientation.

In addition to Ross Taylor's paper, three papers in Volume 2 will be useful for those school districts reexamining their basic skills program. In "Basic Skills in Mathematics: The Issue Regarding Computational Skills," Marilyn Suydam discusses the history of the conflict between those who support a narrowly focused curriculum and those who argue for an expanded view of mathematics education. She ends her paper with a discussion of implications for educational practice, including ten "Tenets on the Teaching of Computation."

In "A Child Is More than a Machine," Alan Hoffer describes the importance of developing

Figure 4. Mathematics Instruction

Questions to be asked by planners for each category:
What is the current practice in our school district? What is overemphasized? What is underemphasized?

Goals	**Focus on Computation**	**Other Approaches***	**Focus on Problem Solving**
What are the skills taught?	Addition, subtraction, multiplication, and division with whole numbers, including a mastery of the basic facts, computing with multidigit numbers, and an understanding of certain generalizations related to computation. Addition, subtraction, multiplication, and division with common fractions and with decimal fractions.		Problem solving, estimation, predicting, reasonableness of results, computer literacy, etc. Addition, subtraction, multiplication, and division with whole numbers, with common fractions, and with decimal fractions are taught within the context of problem solving.
Instruction			
What is the order in which instruction takes place?	Easier skills or component skills are taught before more complex skills. Usual order is counting, basic facts, addition, subtraction, multiplication, division, fractions and decimals. The complexity of skills taught in any of these categories increases as students progress. For example, the notion of place value is introduced early and continues for many years.		Order is flexible. Children come into school with the ability to solve simple problems. This ability is expanded upon through the use of word problems that involve addition, subtraction, multiplication, division, and fractions. Computation work thus has a problem-solving flavor.
How are skills taught and practiced?	Young children are taught place value through the use of manipulatives and visuals. Instruction in the basic mathematical computational strategies usually follows this pattern: The teacher explains and demonstrates a strategy for the students, usually has several students work a problem at the board, then has all of the students work a number of the problems at their seats or for homework. Focus on drill. Understanding of the concepts is an outcome of the ability to solve computation and word problems correctly.		Skills are taught and practiced through problem solving. Teacher acts as facilitator and question-asker. Children are given word problems that involve use of critical thinking skills and computation. They apply their own strategies to arrive at solutions. Computation skills grow out of their experiences with these problems. Focus on developing an understanding of the concepts. Heavy use of manipulatives and visuals.
What kinds of learning experiences do students have?	Emphasis on learning by frequent practice rather than by insight. Learning by memorizing facts, working many examples of the same kind of problem. Primarily paper-and-pencil activities. Some early use of manipulatives. Interaction with teacher primarily in large group settings.		Learning by solving problems — teacher-assigned, student-developed, and "real life." Emphasis on understanding concepts reinforced by frequent interactions with teacher, who asks lots of questions. Manipulatives are always available to make the abstract concrete.

*These lines represent other possible approaches to mathematics instruction.

Figure 4. Mathematics Instruction (Continued)

	Focus on Computation	Other Approaches	Focus on Problem Solving
What is the setting in which learning takes place?	Primarily in school, using commercially published textbook, workbooks, and worksheets for drill.		Primarily experience based, using children's own intuitive abilities to create a functional, meaningful base for learning. Stress on solving problems that relate to the children's lives outside the classroom. Many "real-life" problems may take the children outside of the school.
How is the learning situation structured?	Highly structured and purposeful, with skills to be learned in a specific order. Teacher may divide the class into small groups based on ability, so that extra help can be given to low-ability students.		The teacher serves as guide and facilitator in a relatively informal setting. Skills are learned as the children need or are otherwise motivated to learn them. Lots of one-to-one and small group work, with small groups based on children's interests. Lots of student questions and interactions are encouraged.
How do teachers respond to students' creativity?	Student creativity is not a focus of the mathematics education program.		Student creativity is highly encouraged.
How are student "errors" viewed?	Specific skill deficits are diagnosed by the teacher based on identification of recurrent error patterns. The child is given individualized instruction and additional drill to help correct the problem. Children with similar error patterns are helped in small groups. Emphasis is on accuracy and on single algorithmic path to solution.		Risk taking on the part of the student is a critical part of the learning experience. Errors are accepted as a natural part of this process. While the student is learning a concept, the process he or she uses to solve a problem is more important than the final answer. Because of the importance of estimation and approximation skills, it is important that the student not feel he or she *has* to have the "right answer" all the time. The teacher's role is one of guide and facilitator. Instruction stresses multiple algorithmic paths to solution.
How is instruction in various skill areas or content areas coordinated or integrated?	Integration with other instruction does occur. For example, when a teacher sets up a bank or a grocery store in the classroom, children use their reading and oral communication skills when they are involved in the activity. Such activities may be an integral part of the curriculum.		The focus on problem solving, on developing skill in making inferences, and on having children verbalize their understanding of mathematical concepts, as well as engage in frequent dialogues with the teacher, means that reading and oral communication skills play critical roles in the program. These skills are continually reinforced and/or strengthened as children work to solve problems.
Assessment *How is learning assessed?*	Students are generally pretested at the beginning of the year to determine their skill level. Frequent paper-and-pencil tests occur throughout the school year. Many teachers do speed tests to assess students' internalization of the basic mathematical facts. Students have frequent homework assignments, which are usually graded by the teacher.		Teacher observes and monitors the progress students are making in developing an understanding of mathematical concepts. Continual asking of questions and analysis of students' responses facilitates this process. Paper-and-pencil exercises are used, but they are less important than a student's ability to verbalize his or her understanding of a concept.

insight in children. Insight is the ability of a child to draw upon his or her knowledge and experience to perform competently in an unfamiliar situation. Hoffer offers many examples of how teachers can use mathematics instruction to help children develop insight.

Betty Beck suggests ways to include real-problem solving in the school program in "Learning in Real-Life Contexts." Real-problem solving means involving students in actual school or community situations which they would like to see changed. Beck discusses evidence showing that "there is more effective learning of both mathematics and language arts skills and inquiry skills when students learn them together by dealing with real problems."

A Final Note

The discussion on the preceding pages has been offered as an overview of the papers in Volumes 1 and 2 of *Basic Skills Issues and Choices*. It is not meant to be definitive, just as the papers are not meant to present all of the knowledge we have acquired in the areas they deal with. But they will serve as a starting point for planning committees that are attempting to create a common base of knowledge from which to begin their work.

Improving educational programs can be a highly rewarding experience, but it can also be a complex, time-consuming venture. School districts hoping to improve the achievement of their students must begin with a planning process that involves the best and most appropriate people, a reasonable time schedule, and the most up-to-date data and material resources. In these papers, we offer school districts the combined expertise of hundreds of educators and researchers who have been involved in the improvement of basic skills programs at all levels of schooling. We hope that the results of this collaborative experience will benefit the educational community.

Summaries of the Papers

Volume 1

Issues in Basic Skills Instruction

Linda M. Anderson. **Classroom Management: Making Time to Learn Basic Skills.** Because its purpose is to support instruction and to create an environment for learning, effective classroom management is critical to the success of any basic skills instructional program. Involving much more than discipline, classroom management includes organizing the physical environment of the classroom, scheduling and pacing activities, organizing supplies and instructional materials, and monitoring students' progress, attention, and behavior. The amount of time that students spend on learning tasks determines the usefulness of management strategies in various classroom settings.

Dorothy S. Strickland. **Integrating the Basic Skills through the Content Areas.** If the basic skills are to provide students with the means to attain the information required for successful living in modern society, then teachers and administrators must reorganize the curriculum to integrate the basic skills into a unified communications program. Such a program requires that basic skills be applied in combination with one another and that they be taught in a context that is of interest and importance to the children. This integration of skills allows instruction to take place in a holistic manner and provides for the monitoring of basic skills objectives in an organized way.

Majorie Farmer. **The Essentials of Education: Basic Skills in Context.** "The Essentials of Education" represents a joint effort by leaders in over 20 major national professional educators' associations to develop, discuss, disseminate, and implement a working definition of educational interdependence at all levels of the educational process. Some of the implications of this statement include: a definition of basic skills that includes written and oral communication; the teaching of language and reasoning in all content areas; multicultural awareness in teaching; maintaining the natural interrelationship between learning and interest; attention to the physical environment and social context of learning; and life-long learning for parents and teachers.

John L. Meehan. **State Leadership in Basic Skills.** The Pennsylvania Comprehensive Reading/Communications Art Plan (PCRP) evolved from a 1976 decision by the Pennsylvania Board of Education to define quality education in terms of basic skills. With advancing student competence in reading and oral and written communication as a goal, PCRP defined four major categories of action: responding to literature (heard, read, visualized, or dramatized); sustained silent reading; written and oral composing; and mastering language patterns (spelling, syntax, meaning). Since its inception, PCRP has been piloted in small rural districts and medium-sized, semi-rural districts, has served as an intermediate unit for 12 districts and 99 schools, and has served as a model for hundreds of schools throughout the country.

James R. MacLean. **Forward to the Basics — Ontario Style.** In an effort to involve teachers, students, and parents more actively in the integration of basic skills with other segments of the curriculum, the Province of Ontario, Canada, adopted a curriculum model composed of carefully balanced components. These components stress the individuality of the child and focus on the following: aims and objectives based on knowledge of children's and society's needs; content selected from the environment; dynamic teaching and learning processes derived from the content; and the assessment of outcomes in terms of effectiveness, appropriateness, and relevance.

Betty M. Beck. **Learning in Real-Life Contexts.** Real-problem solving classes, where students are involved in changing school or community situations that are important to them, reinforce a wide variety of mathematical and language arts inquiry skills. In these classes the students, not the teacher, choose the problem to be tackled, decide what factors need to be investigated, search out the facts, try out possible solutions, and judge the effectiveness of their results. Several assessment studies of schools that offer these classes reveal that participating students are highly motivated, interact well with their group, and display an ability to choose and apply objectively measurable reasons for their decisions and to discern effective solutions.

Thomas C. O'Brien. **What's Basic? A Constructivist View.** In a constructivist view of basic skills, the goal of education is to cause intellectual growth to take place by providing a structural framework of basic skills or operations — such as classifying, ordering, logically multiplying, and inferring — that enable the child to construct and test relationships, and from which subsequent knowledge can evolve. A classroom atmosphere based on a constructivist approach to education allows the students to develop an understanding of the relationships among environment, experience, and inference and an ability to regulate their own internal needs and perceptions within the demands of reality.

Issues in Basic Skills Outcomes and Classroom Planning and Assessment

Robert W. Stump and Nina Selz. **Basic Skills for the World of Work.** A study sponsored by the National Center for Research in Vocational Education defines the three most important abilities required for the world of work as follows: using the reading, mathematics, and writing skills the job calls for; using the tools and equipment the job calls for; and getting along with others. Results of the study suggest that the curriculum at every stage of elementary, middle, junior, and senior high school can focus on the development of these essential skills and others (described in the paper) necessary for adequate performance in the world of work. However, this task requires close cooperation and participation from school personnel, families, and employers in the preparation of children for the world of work.

Georgine Loacker and Marcia L. Mentkowski. **A Holistic View of Adult Abilities.** The faculty of a midwest college undertook a ten-year process to define and measure the knowledge and basic skills that they wished their students to acquire and to assess effective ways to measure the achievement of these goals. In addition to the practical information provided by the college curriculum, the study yielded the following implications for elementary and secondary educators: students need early involvement in the developmental education process; assessment should be diagnostic as well as evaluative; students learn better in an environment that teaches them how to learn; developing the potential of each student means that students must be treated individually; and realizing important outcomes in education requires a carefully planned educational process.

Lena Lupica. **Skills For the Future.** Rapid changes in cultural, ethnic, and language trends, in the composition of the nation's work force, and in technological leadership require a broader definition of the basic educational skills needed to survive in our society. Some skills that focus on reducing daily tension and improving the quality of life include: knowing how to cope with change; being able to anticipate alternative future developments; knowing how to learn; being able to use computer, voice, and visual equipment; having the ability to develop effective human relations; and knowing how to be an effective citizen.

Vito Perrone and Walter Haney. **Classroom**

Monitoring and Assessment. If teachers are to be able to design instruction that successfully helps children to learn the basic skills and if communication with parents is to be effective, then teachers must use consistent, well-organized informal assessment procedures in the classroom, in addition to formal procedures such as norm-referenced and criterion-referenced tests. Assessment must be done frequently, so that it can inform decisions about instruction, and it must be relevant to the instruction that has taken place.

Patricia Weiler. **Planning and Management of Instruction.** If a child-centered basic skills program is to insure continued student skill development and achievement, the responsibility for the instructional process must be shared by teachers, paraprofessionals, administrators, curriculum specialists, students, and parents. For those who make up the instructional team, responsibilities include preparing the instructional package, organizing the classroom, determining an appropriate diagnostic and evaluative process, and participating in inservice programs. Parents support the program through the use of learning games and selective television viewing at home.

Issues in Basic Skills Planning

Michael L. Kamil. **Making Choices in Basic Skills Instruction: Research and Theory.** In planning a basic skills program that is based on what the students need to learn, the collaborative planning group needs an instructional framework that includes working definitions of the words "basic" and "skills" and theoretical bases for determining units of learning, content and format of instruction, individual differences in students, and the role of social dynamics. Possible instructional models for consideration include a subskills model that focuses on the individual components of instruction, a holistic model that places instruction in a whole situation context, and a balanced model that combines specific features of the other two models.

Gerald G. Duffy. **Making Basic Skills Choices: Values and Constraints.** Some issues considered by a collaborative program planning group in designing a specific basic skills program include the following: assessing the local district's position with respect to subject matter, the learner, the teacher, and the learning environment; identifying those constraints which society, special interest groups, and school managers place upon curriculum programs; and identifying the realities of the classroom which affect the implementation of any program.

Charles E. Allen. **At the Barricades: A Cautionary Tale.** In response to a state mandate that students meet minimum requirements before graduation, one school district developed a mathematics curriculum based on the functional application of computation skills. Focused primarily on those mathematics skills needed for survival in the modern world, the materials grouped specific tasks under eight headings: banking, expenses, measurements, money, prices, taxes, wages, and whole numbers. Problems encountered in planning the materials ranged from implementation of objectives to the actual test format and word choices.

S. Jay Samuels. **Characteristics of Successful School Programs in Basic Skills.** An analysis of research studies that dealt with basic skills programs during the past fifteen years indicates that effective programs have a number of characteristics in common. These components include the following: strong administrative leadership; high expectations and the belief that the teacher can make the difference; teacher aides used in direct instruction; teacher training; specific reading objectives; instruction and materials relevant to goals; efficient use of time; high intensity of treatment; and frequent evaluation of student progress.

William Phillip Gorth and Marcy R. Perkins. **Skill Definition in State Competency Testing Programs.** Programs from five states — Georgia, Michigan, Virginia, Massachusetts, and New York — are described. These states identified and defined minimum competencies and basic skills and considered a variety of instructional approaches before developing their particular state programs. Four programs identified reading, mathematics, and oral communication as basic skills subject areas, and the fifth program also specified listening. The focus of program objectives varied from functional to academic skills. Two states combined both skills categories, but differed in the degree of emphasis placed on one or the other. Three states required a state test for promotion or graduation while two states used test results for remediation and curriculum improvement.

John R. Bormuth. **Literacy Is Rising, But So Is Demand for Literacy.** An analysis of several research studies that indicated a decline in the literacy level in the United States reveals a need for a clear definition of literacy and calls for the identification of major flaws in literacy assessment studies. In contrast, a study based on economic trends specific to literacy-related expenditures concludes the following: literacy is a major economic force in our society; a demand for higher levels of literacy exists over a broad portion of the population; and studies on literacy must first ask what norms determine whether or not a person is literate.

Volume 2

Writing

Charles Suhor. **NCTE Statement on Standards for Basic Skills Writing Programs.** Prepared with input from professional associations as well as from the staffs of several school districts and universities, "The Standards for Basic Skills Writing Programs" suggests a basically holistic approach to writing instruction that focuses on effective communication of the writer's ideas in relation to his or her purpose and audience. The practical implications of the Standards require that commercially published materials deal with the whole writing process, that classroom drills be based on student writing needs, and that inservice for teachers provide techniques for increasing student motivation, using group discussion, and teaching effective writing skills.

Robert L. Brown, Jr. **The Movement toward Meaning-Focused Writing.** Since most professional writers do not write the way that textbooks say that writing should be done, an effective approach to writing instruction requires rethinking the traditional definitions of the writing process. Such an approach focuses on the cognitive processes involved in writing and uses teaching strategies that stress the following: prewriting, drafting, revising, and editing skills; student assessment through writing conferences with the teacher or other students; and sentence-combining exercises for fluency and syntax development.

Thomas Newkirk. **The Writer as Experimenter.** A meaning-focused approach to writing instruction assumes that writing is a natural activity closely related to thought and emphasizes allowing the child to explore and experiment with ideas. Based on a process of prewriting, writing, and revision, this approach provides the student with techniques for evaluating writing, stresses the importance of reading student writing aloud, employs individual conferences rather than class presentation, and focuses on the assessment of content, thought development, and communication before that of mechanical or grammatical errors.

Vivian I. Davis. **Teaching the Mechanical Conventions of Writing.** Effective teaching of the conventions of handwriting, spelling, punctuation, capitalization, and grammar requires that these skills be taught within the context of the experiences of the individual student and the writing process as a whole. Some techniques that stress effective written communication include the following: individualized practice in handwriting; the test-study-test method for spelling focused on words needed in student writing; dictation exercises, followed by proofreading and editing in capitalization and punctuation; and grammar presented through student sentence development.

Speaking and Listening

Barbara Lieb-Brilhart. **Standards for Effective Oral Communication Programs.** While the Basic Skills legislation includes oral communication skills in its definition of "basics," several assumptions and some potential conflicts merit understanding and consideration in implementing the "Standards for Effective Oral Communication Programs," prepared by the Speech Communication Association (SCA) and the American Speech-Language-Hearing Association (ASHA) as guidelines in curriculum planning. These assumptions are that oral communication instruction is critical in teaching of the content areas, is worthy of instruction for its own sake, and should be viewed as a separate discipline. Conflicts can arise regarding such issues as the definition of communication, academic standards, teacher qualifications, and methods of assessment.

Barbara S. Wood. **Oral Communication: Holistic Skills/Functional Approach.** One instructional approach to oral language development in children incorporates a functional view of communication centered on five critical functions of everyday interactions: attempting to direct or control the behavior of another; sharing feelings; providing ideas and information; ritualizing (greeting, thanking); and imagining, or dealing creatively with reality. These communication functions are taught through a process that stresses the development of a repertoire of communication strategies, that develops selection criteria for choosing appropriate strategies, that provides practice in implementing communication choices, and that offers methods that children can use to evaluate their communication.

Fred E. Jandt. **Oral Communication: Individual Skills Focus.** After "effective communication, both written and oral" was added to the wording of the Basic Skills Improvement Act in 1978, research specialists identified nineteen speaking and listening competencies as basic to two-person interactions, small group discussions, and public speaking. A number of states then developed minimal competencies in speaking and/or listening to be implemented on either a statewide basis or as a local option. The approaches used by five states — Vermont, Virginia, Oregon, Utah, and Massachusetts — are described here. The lists developed by these states describe competencies in a way that allows their assessment through both informal and formal means.

Clarice P. Lowe. **Application of the Minimal Speaking and Listening Competencies.** Instruction in basic communication skills can integrate both conceptual and experiential learning in a manner that facilitates the mastery of a complex grouping of skills called competencies. An approach to teaching one speech communication competency, that of "organizing messages so that others can understand them," involves activities — such as topical and chronological ordering — that progress from simple to complex levels of learning and also meet John Dewey's four criteria for meaningful experiential learning.

Mathematics

Marilyn N. Suydam. **Basic Skills in Mathematics: The Issue Regarding Computational Skills.** While the definitions of basic skills instruction in mathematics vary from teaching computation skills exclusively to presenting computation along with an expanded set of mathematics skills, factors such as the needs of daily life, tradition, achievement scores, availability of calculators, and teacher capabilities both stress the importance of computation and call for the application of mathematics skills in a broader context. However, despite evidence that drill-oriented instruction produces limited outcomes, trends indicate a return to drill as the primary mode of instruction. A need exists to define teaching methods that produce mathematical competency in children.

Ross Taylor. **The Mathematics Education Profession's View of Basic Mathematical Skills.** Three professional mathematics education organizations have agreed on ten basic mathematics skills to be taught in addition to computation. School districts that are in agreement with the statements of these organizations need to reevaluate curriculum objectives, initiate appropriate curriculum revision, and provide staff development. One school district engaged in this process used the following procedure: definition of objectives by a professional task force; parent and community evaluation of standards; administration and teacher evaluation of available standardized tests; and development of learning activities that place mathematics skills, including computation, in a context of problem solving.

Alan R. Hoffer. **A Child Is More than a Machine.** Along with memorizing, drill, and computation skills, a good mathematics program emphasizes the teaching of insight, a special human skill of seeing and understanding problems. Insight demands creativity and risk-taking on the part of the student and requires that the teacher provide appropriate learning experiences in a supportive, positive, and encouraging classroom atmosphere. Competence in insight provides the child with the ability to perform in unfamiliar situations, choosing the acts required by the situation and eventually resolving the situation.

Reading

Lauren B. Resnick. **Theories and Prescriptions for Early Reading Instruction.** The two main strands of theory regarding the nature of reading can be defined as reading as translation and reading as an autonomous language process. Although patterns in research indicate that code-oriented programs show better results in the primary grades than do language-oriented programs, the need exists for consistent investigation and trial of the language approach before comparison of the two methods is valid. At present, successful instructional programs include both strategies successively. However, a more effective approach presents the code and language aspects of reading simultaneously.

Kenneth S. Goodman and Yetta M. Goodman. **A Whole-Language Comprehension-Centered View of Reading Development.** A whole-language comprehension-centered approach to developing reading ability requires a child-centered classroom where the focus in reading instruction is on meaning, where learning motivation is intrinsic, and where the selected reading materials appeal to the experience, concepts, and interests of the children in the classroom. Specifics of such a developmental reading program include periods of sustained silent reading, a wide selection of books, emphasis on the reading strengths of the students, and student self-evaluation as an integral part of the assessment process.

Douglas W. Carnine. **Direct Instruction: A Bottom Up Skills Approach to Elementary Reading Instruction.** Given that a child's capacity for processing information and creating meaning from the environment is limited, a subskills approach to reading instruction makes meaningful learning possible. It reduces the information load, simplifies the learning act, and allows for mastery learning. Implementing such a program in the classroom requires the following: knowledge of the essential skills or objectives that make up the reading process; program design that involves evaluation and selection of materials; presentation techniques that motivate, reinforce, and assess; effective organization of classroom time; and individualized instruction determined by frequent student evaluation.

Harry Singer. **An Integration of Instructional Approaches for Teaching Reading and Learning from Text.** Reading development consists of two distinct phases: teaching students how to read printed words and then construct meaning from them, and teaching students how to comprehend or learn from texts in the content areas. The initial phase of reading instruction involves the use of informal techniques such as reading aloud to children or discussing books with them, and formal techniques that include the picture-story method, rebus method, basal reader, and individualized instruction. In teaching students to learn from text, teachers can employ single-text strategies, like the SQ3R method, or multiple-text strategies that involve library usage, concept techniques, and projects.

Robert J. Tierney and P. David Pearson. **Learning to Learn from Text: A Framework for Improving Classroom Practice.** A schema-theoretic approach to reading comprehension considers the nature and influence of the reader's background knowledge, attempts a balance between reader-based and text-based processing, and stresses the importance of selected monitoring strategies. Effective instructional practices that evolve from this approach provide the reader with the following: a relevant schema for a text; appropriate activation of this schema prior to, during, and after reading; flexible processes of activating, focusing, maintaining, and refining an interpretation; adequate understanding of the text and purpose for the reading; and awareness of potential applications.

Penelope L. Peterson. **Direct Instruction Reconsidered.** An analysis of research on the effectiveness of "teacher-directed" versus "open" instruction indicates that the traditional approach is slightly more effective, on the average, in increasing students' achievement in basic skills. However, an open approach appears to increase students' creativity, independence, curiosity, and favorable attitudes toward school and learning. Because neither approach meets the needs of all students, educators must incorporate both teaching approaches in a workable combination, if a wide range of educational goals is to be achieved.

Issues in Basic Skills Instruction

Overview: *Papers in this section review research and experience on management of the classroom and coordination of instruction among the basic skills areas and between the basic skills and other areas of the curriculum. In the first paper, Linda Anderson reviews research on classroom management. Dorothy Strickland and Marjorie Farmer then each discuss how basic skills instruction can be coordinated with and reinforced by instruction in other curriculum areas. John Meehan describes approaches to more effective coordination of instruction which have been implemented by the state of Pennsylvania, and James MacLean describes the Ontario program. In the last two papers, Betty Beck and Tom O'Brien provide a rationale and specific suggestions for coordination of instruction around real problem solving situations.*

Classroom Management: Making Time to Learn Basic Skills

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Editors' Note: *Research and experience suggest that, regardless of the approach to instruction chosen, a crucial factor in learning is the management of the classroom. In this paper Linda Anderson reviews research on what comprises effective management with emphasis on the impact on time students are actively involved in learning. She provides examples of interactions of two different teachers with their students to contrast effective and ineffective approaches to management. She then reviews the essential management skills and discusses implications of the paper for staff development and administrative supports. Although Dr. Anderson's major concern is with more effective instruction, most of what she has written here also has implications for effective discipline.*

Most of the papers in this handbook are concerned with decisions about basic skills program content. The many different opinions make it clear that these are not easy decisions. For the moment, however, let us assume that some decisions have been reached about what skills will be emphasized and what programs will be used to teach those skills. After the approach has been selected, decisions must be made about how to get the programs started in classrooms and how teachers will present the skills.

This paper focuses on basic skills instruction in the classroom after goals and objectives have been decided. In particular, the importance of the teacher's classroom management skills is emphasized. *Effective classroom management is critical to the success of any basic skills instructional program.*

Classroom management involves much more than discipline and maintaining quiet. As discussed here, classroom management includes such teacher responsibilities as organizing the physical environment and student movement through the room, scheduling and pacing various activities, organizing instructional supplies and materials and arranging for their use in ways that facilitate learning, keeping up with student progress for the purpose of guiding instruction, monitoring students' attention and behavior to ensure that they benefit from instructional activities, and attending to the many routine details of school life (such as lunch arrangements, storage of outdoor wear, and collection of fees).

The purpose of classroom management is to support instruction and to create an environment in which students can learn most easily. In this sense the teacher is similar to a manager in the business world. All managers are responsible for seeing that group members know what to do and how to do it so as to maximize the goods or services being produced. In the business world, it is taken for granted that the manager's role is necessary. Once decisions are made about new designs or techniques, managers are involved in the implementation of the new plans. Poor management is considered a serious problem in the business world, because it leads to decreased output and less profit, no matter how good the production designs and techniques.

In a classroom, teachers are managers as well as planners and deliverers of instruction, liaison with home and community, and sometimes counselors. However, just as in the business world, if the management is inefficient, other efforts will not yield the desired "product" — each student's learning and development, including achievement in the basic skills.

In this paper, classroom management research is reviewed with special emphasis on ways that teachers manage students' "time on task." Other equally important aspects of management, such as grouping, are not touched on here, because of space constraints.

Time on Task Research

Research conducted in real classrooms supports the importance of management. One purpose of these classroom studies was to relate many types of day-to-day classroom occurrences to important student outcomes, such as basic skills achievement and attitudes toward school.

The assumption underlying such studies has been confirmed repeatedly: individual teachers and what they do in the classroom make a difference in student achievement in the basic skills. That is, some teachers' classes consistently achieve higher on standardized tests than might be expected, given the students' entering achievement, and other teachers' classes consistently score lower than expected (Brophy, 1979; Good, 1979; Good, Biddle, and Brophy, 1975).

Thus, the individual teacher and the way he or she teaches are important factors to consider in improving basic skills learning. This reasoning does not deny that curriculum and school setting are also important factors but emphasizes that it is the teacher who must "put it all together" and bring the instruction to life.

Therefore, researchers have worked to identify those aspects of teaching that make a difference in student outcomes. One of the most important predictors of student achievement in the basic skills of reading, mathematics, and language is the teacher's success at classroom management (Brophy and Putnam, 1979).

Why is classroom management such a potent predictor of achievement? One explanation is that a result of effective management is increased time in which students are engaged with instruction or learning activities. The importance of adequate "time on task" has been demonstrated in many research studies (Denham and Lieberman, 1980; Rosenshine and Berliner, 1978). Good classroom management prevents wasted time and minimizes disruptions that distract students from involvement with learning.

One of the most important predictors of student achievement in the basic skills of reading, mathematics, and language is the teacher's success at classroom management . . .

It makes sense that students who are given more time for learning will be more likely to benefit from instruction. However, the quality of that time is critical. One important result of the study of time use in classrooms is the distinction between "scheduled time" and "engaged time." Scheduled time is formally allotted to a given subject or activity. Engaged time is the time during which a student actually is involved with the content during the scheduled time. For example, a teacher may schedule thirty minutes a day for mathematics instruction and activities. Few students will spend the entire thirty minutes actually engaged in mathematics activities. All learners are distracted occasionally, some spend time performing necessary routines (such as sharpening pencils), and some are delayed in their progress because they have questions about their tasks. All of these factors influence the amount of engaged time that occurs within the scheduled time.

How students spend their time in class, that is, the amount of time they are engaged, is greatly affected by the teacher's management of the classroom. Resulting differences in students' time use may be an important factor reflected in differences in achievement scores, given adjustments for beginning achievement. Hence, it is easy to understand the strong connections between effective classroom management and student achievement: *What the teacher does to establish and maintain the flow of events in the classroom influences how easily and willingly the students can attend to, interact with, and learn from the instructional activities.*

To illustrate this point, two examples are given below of teachers conducting mathematics lessons with similar students, similar objectives, and similar access to resources (although their use of the resources varies). Each teacher is following the new school policy on teaching certain basic mathematics skills. Each is using the new curriculum program being piloted in the school.

In each class, the teacher has scheduled a thirty-minute period in which students are to practice application of material presented earlier. As you read, think about how the students use the time.

Classroom A

1:05 The students return from lunch. Several congregate around a friend's desk and chat about an occurrence on the playground. The teacher asks them three times to be seated.

1:10 Finally all students are seated. The teacher passes out two worksheets to each student. While doing so, she corrects some students for talking and stops to help another student locate his book.

1:14 The teacher begins the explanation but waits while two students sharpen their pencils.

1:16 While the teacher explains the worksheets, students call out questions, which she answers, and a few irrelevant comments. Once the teacher stops to ask students in the back row to pay attention.

1:23 The teacher finishes the explanation and tells the class to begin working. She briefly returns to her desk and then momentarily leaves the room to return forms to the office. About half of the students start working.

1:25 The teacher returns from the office and checks on a student with his hand up. He is confused, so she works with him for ten minutes.

1:30 Seven students have finished and remain at their seats, chatting, with nothing else to do. Seven other students alternately work on their assignments and chat or wander about. Occasionally the teacher reminds some students to be quieter, but this does not reduce the noise or activity level. Two students do not understand the procedures and complete the assignment incorrectly (they will not realize this until the next day when work is returned). Five other students work only the first few problems and spend the rest of the time socializing. They do not complete the assignment.

1:35 The teacher looks up from the student she is helping and announces that it is time to leave for assembly. Students who did not finish their papers are instructed to finish them at home.

Classroom B*

1:05 The students return from lunch and pick up two worksheets from baskets before they go to their seats. (Before dismissal for lunch, the teacher told them to do this, and then she reminded them as they entered the room.) Some students quickly sharpen their pencils before being seated (according to established routine).

1:07 All students are in their seats with worksheets and sharp pencils. The teacher begins the explanation. According to routine, the students hold their questions until she is finished and has worked an example problem. Then she asks for questions. There are none at this point.

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* Some of the instructional principles in effect in this anecdote are based on a mathematics teaching model designed by Good and Grouws (1979). Readers may consult this source for an organized set of suggestions for management of mathematics lessons.

1:11 The students start working, while the teacher circulates through the room, looking at each student's work.

1:13 Four students who are having difficulty applying the principles are called over to a table, where the teacher reteaches the concept or skill. The other students are working independently. Occasionally a student whispers to another one, but then returns to work. The teacher periodically looks up from the small group to scan the room but does not interrupt her instruction.

1:20 The teacher gives three practice problems to the group at the table and goes to check on the other students' progress. She answers a few brief questions and discovers that two students have not made much progress because they have been drawing funny pictures for each other. She separates them and reminds them that unfinished work must be completed during recess or after school. They resume work.

1:24 After checking on all of the students at their seats, the teacher returns to the small group while they finish their problems. She checks the answers, gives the students a short practice assignment, and then dismisses them.

1:25 As students finish the worksheets, they go to the math center to choose another activity. About half have chosen after-work options in mathematics and are working intently on games or other exercises.

1:30 The teacher reminds the students that they have five minutes before assembly. They start to clean up their desks.

1:35 The students exit, placing completed work in the basket as they go. All students finished the assignment; some students also did enrichment work.

Several points are apparent from careful reading of the two anecdotes. Most important, in classroom B more students spent more time actively engaged with mathematics content. In classroom A only twelve of the thirty minutes were used for active practice of the concept or skill. Nearly the same time (eleven minutes) was required to get students settled and supply worksheets. The teacher's explanation lasted seven minutes, half of which time was taken by questions she had planned to answer later in her explanation and by the need to call for students' attention. Within the twelve minutes left for practice, some students "played around," some did their work and then were unoccupied, and others practiced incorrectly.

Students in classroom B conformed with the teacher's expectation that they follow routines to use time efficiently and to concentrate on their work during the time allotted. As a result, they spent more time engaged with appropriate tasks. Those students not ready for the class assignment were quickly identified and given the instruction they needed. Students who rapidly completed their work engaged in activities that reinforced other aspects of mathematics.

Two constraints are apparent from such classroom observations. First, teachers have a limited amount of time into which they must cram instruction in many content areas as well as many other school activities (such as assemblies). One result of the many required activities is that the day is broken into shorter segments. Transitions between instructional segments, if handled inefficiently, can further erode available instructional time.

Second, teachers are responsible for many students with varied needs. This must be recognized in instruction, of course; but it also means that one aspect of a teacher's job must be "crowd control," since the academic progress of any student may be affected by other students' behavior. All students benefit when the prevailing norm is that schoolwork is taken seriously. But when many students are "off task" much of the time, the result may be perpetual distraction for almost everyone, especially those students whose attention is most easily diverted.

These "universal" constraints imposed on teachers need not imply a hopeless situation. Individual teachers, through well-planned and consistent management, can cope with many constraints and create a productive classroom environment (assuming some administration support). When this occurs, a basic skills program has a higher chance of success, because students actively encounter more of the content.

Essential Management Skills

The most important characteristics of effective classroom management, based on research in real classrooms, are summarized below.* Most of this research was conducted in elementary classrooms, but recent work on management in junior high schools (Emmer and Evertson, 1980) suggests that the general principles apply there as well, although specific procedures, of course, vary.

One useful way to organize thinking about management is to consider what teachers must do *before* instruction (preventive management) as well as what must be done *during* instruction (maintenance management).

Preventive Management. A recurring theme in management research is the value of preventing behavior problems through the initial establishment of an orderly and predictable classroom (see, for example, the review by Brophy and Putnam, 1979). When management problems are prevented, they do not consume valuable instructional time.

Teachers who are successful at preventing problems begin by carefully teaching students procedures and rules. This instruction is best given at the beginning of the school year (Emmer, Evertson, and Anderson, 1980; Evertson and Anderson, 1979). Procedures cover routine situations such as transitions to and from the room and within the room, sharpening pencils and getting supplies, getting teacher assistance, when and how to attend to the teacher, collecting and returning assigned work, and attending to personal needs (bathroom, water, coats, and so on). Rules establish appropriate activity and noise levels. Effective managers enforce and maintain rules and procedures through frequent feedback to the students about their behavior.

With early establishment of rules and procedures, students learn how to behave in ways that support learning. The objective is *not* peace and quiet for its own sake, but a productive work environment. One reason that the students in classroom B had more time engaged in learning activities is that they followed several time-saving routines (such as getting supplies ready and holding questions until all information was presented). They also knew the acceptable noise and activity levels. As a result, *each* student had a better chance of benefiting from instruction and practice.

With early establishment of rules and procedures, students learn how to behave in ways that support learning. The objective is not peace and quiet for its own sake, but a productive work environment.

In addition to teaching students appropriate behavior, the teacher who is skilled at preventive management also makes sure that the work assigned to students is challenging enough to be interesting but not so difficult as to be frustrating. Satisfying after-work options must be available. Clearly, one requirement for good management is good instruction that provides the students with appealing alternatives to "off task" behavior.

Maintenance Management. After rules and procedures are clearly established and students have been provided with appropriate learning activities, the teacher continues to play the manager's role by regular monitoring and supervision. This is important for two reasons. First, credibility with students is maintained only if the teacher consistently informs the class through his or her actions that "I meant what I said." Second, regular monitoring reveals when the teacher needs to adjust the flow of activities to prevent problems that might arise from confusion or distraction. Sometimes this necessary adjustment is instructional; sometimes it involves corrections for misbehavior or removal of distractions.

Instructional monitoring and subsequent adjustment involve many non-managerial skills that are beyond the scope of this paper. However, one important management task is to ensure that time is set aside and procedures are worked out to allow the teacher to pursue instructional monitoring. Better managers systematically review students' work during the day. It is profitable to do this regularly when students are working independently. Teachers who organize small groups may take advantage of transitions between groups (or short stretches of independent work in the small groups) to circulate among other students. Frequent teacher contact ensures that each student is "on the right track." This is especially important for students whose independent work skills or basic skills are not strong.

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*For more information on specific points, consult Anderson, Evertson, and Brophy, 1979; Anderson, Evertson, and Emmer, 1980; Brophy and Evertson, 1976; Brophy and Putnam, 1979; Emmer, Evertson, and Anderson, 1980; Evertson and Anderson, 1979; Good and Brophy, 1978; Good and Grouws, 1979; and Kounin, 1970.

One advantage to regular instructional monitoring may be that students gain a greater sense of accountability, which may in turn increase their motivation to stay on task. Teachers can increase this sense of accountability by regularly returning work to students quickly or otherwise providing feedback on progress. Again, this essentially instructional task is more easily accomplished when the teacher, as a manager, schedules time and establishes routines to accomplish it.

Behavioral monitoring is performed continuously by better managers. A term commonly used to describe teachers who are aware of their students' behavior is "with-it-ness" (Kounin, 1970). The "with-it" teacher frequently scans the room, making sure that students are purposefully occupied. The great advantage to frequent scanning is that many potential disruptions can be stopped before they become problems (that is, before there is a ripple effect). A less "with-it" teacher notices a disturbance only after it has gone so far as to distract several students. Effective managers learn to overlap their attention so that they can carry on instruction and monitor behavior at the same time (Kounin, 1970).

The teachers described in the above anecdotes differ greatly in their attention to both preventive and maintenance management strategies. In classroom A many problems arose because time-saving routines had not been established. These problems were compounded by teacher failure to provide either instructional or behavioral monitoring. Teacher B was more successful in all these aspects of management, as reflected in the students' "time on task."

These research findings reflect a systematic verification of many teachers' own theories about how to manage classrooms. The value of the research is in the compiling and organizing of important principles and the documentation that these teacher skills do indeed relate to student achievement in basic skills.

Implementation of these management principles depends on the type of classroom, the skills and needs of the students, and the instructional objectives. Specific management routines that work best in an open classroom where language experiences are encouraged will not work best in a traditional classroom where a highly structured skills-based program is in place. What works to encourage good behavior in first-graders will not work with sixth-graders. However, in all cases it is critical that the underlying management support the instructional goals, promoting time on the tasks that have been determined to be important.

Implications for Decision Makers

Staff Development. It is not enough to define basic learning skills, select a program, and then assume that student achievement will result if the appropriate curriculum has been mandated. Think about how successful that program is likely to be if teachers find it difficult to manage.

Many teachers are excellent classroom managers who work very hard to ensure that students learn the curriculum content; others are not. Often, providing poor classroom managers with new instructional objectives and curricula without also providing them with management training is to doom them — and the new program — to failure.

Administrative Support. Recognizing the importance of management may lead to adaptations in instructional programs. For example, any program that requires that the teacher spend long periods concentrating on individuals will succeed only if some assistance is provided for monitoring the other students. If these duties are given to an aide, then he or she should be carefully trained.

Other administrative support is necessary to ensure that teachers do not have to use much classroom time to deal with out-of-class issues. For example, the teacher in classroom B would not have been able to use time so effectively if she had to monitor many children during lunch or was delayed by a fight in the lunchroom or by a misplaced lunch box. Teachers must receive a loud and clear message from administrators that their efforts toward efficient use of instructional time are not only appreciated but actively supported.

Program Evaluation. In judging the success of any basic skills program — either present efforts or proposed changes — consider whether results are attributable to the content of the programs or their implementation in classrooms. That is, if student scores are not as high as expected, consider that, at least in some classes, students might not spend their learning time effectively. This means that evaluation designs must include data collection on what actually happens in classrooms.

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Integrating the Basic Skills through the Content Areas

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Editors' Note: *In this paper Dorothy Strickland discusses important interrelationships among the four basic skills in the development and ongoing functioning of the individual. She stresses the need to coordinate instruction in the basic skills and to coordinate basic skills instruction with other content in the curriculum. Both of these efforts, she suggests, should relate the learning experience to situations outside of school. After discussing some of the problems which interfere with the interrelating of basic skills instruction in schools, she provides a framework to help teachers to make optimum use of instructional opportunities both to teach and to reinforce each of the basic skills.*

What Are the Basic Skills?

Often, definitions of the basic skills are very narrow. For the purposes of this discussion, the basic skills are considered to include virtually every means by which humans communicate: reading, writing, listening, speaking, mathematical problem solving, and computation. When viewed as processes through which a broad array of content can be mastered, these components not only represent the foundation skills required for survival but also include the enabling skills that produce mature independent learners.

The goal is not to limit students to a narrow view of the basics but to broaden their view so that they regard the basics as a means to gaining access to the information required for successful living in modern society. This paper is intended to help teachers and administrators reexamine and reorganize the curriculum in order to integrate these basic components into a unified communications program.

How Are the Basic Skills Related?

To integrate the basic skills as defined, an understanding of them as an interrelated means of communication is important. At the heart of any communications model must be the learner's experiences, because it is these experiences that stimulate the need or desire to communicate. All learning is essentially an attempt to make each new experience fit into an existing construct of the environment. We continually add to our store of knowledge and understanding as we transform the unfamiliar into the familiar, relate the unknown to the known.

The learner's experiences represent the content on which he or she focuses. In schools this may involve the natural sciences, social sciences, creative arts, and the functional content of the survival curriculum. A broad range of "essentials" should be included in the content so that students become informed, thoughtful, participating citizens; in addition, no content of interest and importance to the learner need be omitted from the school experience. The processes through which the learner attempts to assimilate this content are the basic skills — literacy, oracy, and mathematics.

Literacy, oracy, and mathematics involve the use and interpretation of symbols that represent experience. The ability to decode and encode our experiences through symbols is a developmental process that begins at birth. The learner first engages in activities and then can discuss those experiences (talking and listening), read and write about them, and solve problems related to them. The same experiential base is drawn upon, whether the communication is through print or speech. The base can be used as a point of departure for studying topics of interest and importance to students in conjunction with activities involving the full range of basic skills.

Oracy, literacy, and mathematical problem solving involve the projection of meaning by the learner. Readers and listeners bring meaning to the content or message in order that they may comprehend it. Writers and speakers project meaning as they attempt to communicate their ideas to others. Mathematical problem solving also requires the projection of meaning in the form of prior knowledge and understandings about the concepts involved. On the basis of these understandings, the learner makes decisions about appropriate procedures for computation.

The range and quality of experience, or prior knowledge, the learner brings to each new learning experience critically affect comprehension and production. The time spent, for example, in preparing the learner for a task by providing background in vocabulary and concept development will "pay off" in his or her ability to understand and apply the content. Generally, the more concrete those preparatory experiences, the better prepared the student will be to tackle the more abstract communication processes. Preparation that takes into consideration all the basic skills involved in a task helps the learner gain access to the content, comprehend it, and use it effectively.

Although listening is related to oracy and reading to literacy, they share common characteristics as *receptive* processes. The ability to comprehend information — to recall it, interpret it, and apply it — is essential to both. Teachers who help students become more proficient readers help them become better listeners as well.

Speaking and writing share common characteristics as *expressive* processes. Whether a child composes through speech or writing, certain abilities are required. The ability to gather information, select what is significant to the topic, organize it, and present it with clarity and a sense of audience are significant to the composing process regardless of mode. Teachers who help students develop these skills through oral reporting, for example, are supporting the written composition process as well.

Mathematics involves the basic skills of listening, speaking, reading, and writing. Underlying these abilities must be an understanding of a specialized set of vocabulary and concepts, as well as a specialized means of organizing and analyzing phenomena. Competency in language is necessary to generate and analyze data for mathematical problem solving and computation; in other words, success in mathematics is directly related to oracy and literacy.

Problems Associated with Integrating the Basic Skills

Two broad issues must be dealt with when teachers attempt to integrate the basic skills. Both present numerous challenges to the teacher. The first issue centers on those problems associated with the need to teach basic skills in much the same context as they are applied — not in isolation but in combination with one another. For example, except for recreational reading, we rarely engage in reading as a separate communication skill. More often, we take notes on what we are reading or use the material for discussion purposes or mathematical problem solving. Thus reading, writing, mathematics, and oral language are seldom used in isolation from one another. These basic communication processes are so interrelated that we move from one to another with ease as we approach daily tasks involving them.

In departmentally organized school programs, and even in most self-contained classrooms, the basic skills frequently are scheduled during separate periods of the day, with little attempt to relate the content taught in one area with that taught in the others. Reading, writing, oral language development, and mathematics are planned for and taught as discrete entities. Such fragmented planning tends to perpetuate teachers' and students' misconception that what occurs during a mathematics or listening activity is distinctly different from the skills taught during reading or writing activities. To the extent that this happens, students are less likely to apply skills learned in one setting to a new situation.

As much as possible, the basic skills should be treated as a unified whole. This is the way they are most often used in real-life situations. Greater coordination among departmental staff in basic skills instructional efforts and more attention to coordination within the self-contained classroom are essential. Students should purposely be given activities planned to involve them in the use of two or more skills in combination, for example, listening and reading, reading and writing, or reading, discussing, and then solving a mathematics problem.

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Such activities will make both teachers and students more aware of how the various skills support one another. Sensitivity about the reading skills required in a mathematics lesson or the kind of listening skills required to take notes for a written report is strengthened. Even when lessons are focused on one basic skill, teachers should use every opportunity to help children apply other skills to the learning.

The second issue involves the integration of process and content. In real-life situations, the way we use language and math is always focused on content of relevance to us. Whether the need arises from the world of work or of recreation, the basic skills we employ are based on our need to communicate and to solve problems. There is a need to bring this same kind of relevancy into basic skills instruction by teaching the basic skills through content of interest and importance to children.

Most teachers are keenly aware of the problems associated with application of the basic skills in the content areas. In departmentalized programs students are made to focus on a particular subject area, such as science or social studies, with a specialist-teacher at specified times during the week. Mastering the course content is generally emphasized in these classes, with little thought given to instruction in the processes required to gain access to and understanding of the content.

Even in self-contained classrooms fragmented scheduling may result in the same type of instruction. Often students receive regular instruction in study skills in parallel settings apart from the content area subjects. This may be included in a developmental or remedial reading program relying heavily on workbook and worksheet exercises. The problem rests with the application of skills. It is not unusual for students to appear competent in skills in a virtually content-free, narrowly confined situation apart from "real" content in which they are interested (or at least for which they are responsible), only to demonstrate an extraordinary lack of proficiency in applying those very same skills when needed.

Greater coordination between basic skills (literacy, oracy, and mathematics) and content instruction (physical and social sciences, humanities, industrial arts, and so on) is needed. Students must be given opportunities to select and apply appropriate skills under guidance, if they are to use them as life resources. In departmentalized settings, specialized-area teachers must give sufficient time to the basic skills instruction required for students to gain access to the content under consideration. Teachers of reading/language arts and mathematics should know what topics are under consideration in the content areas so that they can support their students' efforts. Students studying ecology, for example, may be given help in locating and organizing relevant information and in preparing oral and written reports. Similarly, charts and graphs describing numerical data can be generated along with mathematical problems for discussion and analysis using the mathematics skills being taught.

The basic skills are only useful to the degree that they enable us to fulfill our need to communicate about content that is significant to us. These processes — reading, writing, speaking, listening, mathematical problem solving, and computation — merely facilitate our reception, expression, and application of content. At every level of instruction, process and content should be integrated.

Integrating the Basic Skills

The Basic Skills Integration Chart (Figure 1) is designed to help teachers achieve integration both among the basic skills and between the basic skills and the content areas. It has been well received in staff development settings and in classroom applications. Most teachers have expressed the view that it offers an easy means of ensuring full, integrated coverage of the basic skills through a thematic unit of work.

The various basic skills are depicted in terms of mutually supportive activities. Since most teachers prefer to deal with actual activities rather than lists of objectives or subskills, this approach appeals to them.

In row 1, box 2, activities showing how reading and writing support each other are illustrated. Next, the interface between reading and listening is shown, then reading and speaking, and so on. The grid presents the interrelationships among the basic skills in a practical way for immediate teacher use. By applying the grid to a specific grade level and topic, the teacher can generate a set of activities specific to the needs of a particular group. An entire unit of work can be built in a way that accounts for both content and basic skills instruction. To use the chart teachers are asked to

1. Decide on the grade level or levels to be served.
2. Decide on a content theme. Science or social studies themes work best.
3. Decide on a limited number of specific content and process goals and objectives.
    a. Content goals and objectives relate to the substantive material under consideration. Example: Study of how archeologists contribute to our understanding of civilization.
    b. Process goals and objectives relate to the basic skills operations the students are expected to develop. Examples: Use of the card catalog (reading/study skills); collection and organization of data to make a bar graph (mathematics).
4. Use the information in each box in the grid to generate activities appropriate for 1, 2, and 3.

Figure 2 shows an example of how teachers can use the Basic Skills Integration Chart to organize a set of integrated activities around a theme. Positive outcomes associated with using the chart include the following:

- Teachers are forced to think in terms of process and content simultaneously. The activities they plan emerge as the result of a purposeful effort to integrate skills. They are not activities planned for activity's sake. Teachers not only know what they plan to do but why.
- By purposely merging process and content, teachers can reduce the constant problem of trying to find time in the day for all that is considered important.
- If the students have been properly motivated, there is built-in interest in the application and development of the basic skills. Desire to get at and apply the content promotes basic skills instruction.
- Identifying at least some of the objectives in advance helps teachers to focus their activities on specific skills or subskills for which they may be accountable.
- At a time when accountability for specific skills is stressed, teachers can engage children in interesting activities related to topics that naturally emerge in the classroom and still feel in control of systematic basic skills instruction.
- Specific subskills may be accounted for by breaking down any one of the communication skills presented. For example, if a

teacher wants to concentrate on oral reporting as the type of speaking activity to be stressed in a particular unit or theme, the following subskills might be emphasized and evaluated: organizes information well, speaks clearly, and has a sense of audience. Some of the activities slotted into the "Speaking" boxes in the grid would allow practice in and demonstration of those subskills.

Conclusion

Integrating the basic skills requires curriculum implementation that not only stresses the teaching of reading, writing, mathematics, and oral language in conjunction with one another but also emphasizes that they be taught through content of interest and importance to the learner. Every opportunity to interrelate instruction in the communication processes with one another and with the social and natural sciences is critical.

An approach that helps teachers to plan for integration allows instruction to take place in a natural, holistic manner. At the same time, administrative requirements for monitoring basic skills objectives in an organized way can be satisfied.

	Literacy		Oracy		Mathematical Communication
	Reading	**Writing**	**Listening**	**Speaking**	**Problem Solving and Computation**
Reading		Reading serves as model and stimulus for written composition. Children read each other's material and that of professional writers.	Listening to literature read aloud strengthens auding skills for enjoyment and for special purposes. Reading and listening are receptive processes dependent on comprehension.	Reading provides material and models for oral composition: storytelling, reporting, dramatic readings, poetry.	Reading provides access to information requiring mathematical solutions or attention. Reading involves the interpretation of tables, charts, and graphs.
Writing	Written composition produces charts, stories, books for classroom use as reading materials.		Written composition may be read aloud or tape recorded for others to enjoy and gain information from.	Professional- or child-authored materials may be read aloud. Notes may be used as basis for oral reports. Writing and speaking require ability to select significant ideas and organize with clarity and sense of audience.	Written composition may involve taking a set of circumstances and composing a written problem for solving. Information written in narrative may be condensed into simple tables, charts, graphs.
Listening	Listening to literature read aloud motivates reading and adds to one's store of information and enjoyment.	Listening to stories and reports provides the basis and stimulation for written composition.		Critical listening to spoken word strengthens ability to reason and to respond orally. Listening provides model for oral composition.	Listening to a set of circumstances can lead to learning how to proceed toward a mathematical solution.
Speaking	Stories and poems may be read aloud or dramatized. Oral reports, descriptions, and explanations may be aided by written notes. Discussion may provide impetus for further reading.	Storytelling or reporting may be the outgrowth of or stimulation for composition.	Reporting, sharing, and discussion provide material for various types of listening.		Oral description of a set of facts or real-life circumstances may lead to a discussion of alternative ways to approach mathematical problem solving.
Problem Solving and Computation	Problems and examples may be read for analysis and problem solving. Graphs, charts, math examples may be analyzed.	Children write their own story problems for others to solve. Sentences may be written in words or in numerals and math signs.	Purposeful listening to solve a problem may lead to mathematical solutions and the use of mathematical principles to make predictions, estimating.	Discussion of everyday situations may be translated into mathematical terms for problem solving. Children may orally compose problems for others.	

Figure 1. Basic Skills Integration Chart.

Grade 5
Topic: King Tutankhamen

		Literacy		Oracy		Mathematical Communication
		Reading	Writing	Listening	Speaking	Problem Solving and Computation
Literacy	Reading		The learner will read the telegram sent by Lord Carnarvon and write his or her own original version.	The learner will read a description of the death mask and draw a picture of it for sharing and discussion.	The learner will read about the wooden articles found and discuss their possible uses.	The learner will read a time line in order to determine in what century Tut reigned.
	Writing	The learner will write a story describing the first day of discovery.		The learner will write an original cinquain poem about King Tut to share with the class.	The learner will take notes on the kinds and uses of jewelry found in the tomb and report orally to the class.	The learner will help to create a mail order catalog of items selected from King Tut's tomb and write related problems for others to solve.
Oracy	Listening	The learner will listen to an explanation of the mummification process and then read the account of King Tut's mummification.	The learner will listen to the description of the game items found in the tomb and write about what games he or she would have placed there.		The learner will listen to the explanation of how each article was removed and then discuss the process.	The learner will listen to an account of the number of hours spent uncovering the treasures in the antechamber in order to compute the hours into days and to create problems involving manpower and wages.
	Speaking	The learner will discuss and dramatize the discoverers' dialogue at the exposition of the burial chamber and read further on articles found inside.	The learner will report orally on items placed in the tomb for Tut's afterlife and then write a story stating what he or she would have put in the tomb.	The learner will explain orally the use of a pomander in demonstrating mummification and then answer questions and discuss the changes that will take place.		The learner will orally give the dates of major events in Tut's life to determine the Boy King's chronologic age at a given event.

Figure 2. Use of Basic Skills Integration Chart. (After Linda Derrig, teacher, Seattle)

The Essentials of Education: Basic Skills in Context

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Editors' Note: *The Essentials of Education statement resulted from work by officers and members of most of the professional associations immediately concerned with classroom instruction. This statement is different from the statements of standards in mathematics, written communication, and oral communication in Volume I in that it addresses the need for involvement of all aspects of the curriculum in basic skills instruction, rather than suggesting specific content to be included in any one curriculum area. In this paper Marjorie Farmer reviews the concerns that led to the drafting of the statement, the statement itself, and some of the implications for practice. She closes with a description of the important processes of coordination that have evolved as the associations attempt to make the statement meaningful in schools, classrooms, and communities.*

"The Essentials of Education" is a statement of the interdependence of the basic skills of *language* — reading and oral and written comprehension — and *mathematics* — problem solving and logical thinking — with *content* — the arts, sciences, humanities, and technologies — in *contemporary education*. Since the spring of 1978, leaders of over twenty major national professional educators' associations have been working together to develop, discuss, disseminate, and implement the concept of educational interdependence, not only in curriculum and classroom instruction, but in interactions among educators and in communications between the school and the community.

The impetus for this effort was the participation of several association presidents in a Conference on Basic Skills sponsored in March 1978 by the United States Office of Education and attended by over 300 people representing government, industry, and parent and community groups, as well as educators at all levels, educational reseachers, and evaluation specialists. Through three days of reports, recommendations, and discussions, these association leaders became increasingly concerned over the prevailing view about present and potential basic skills achievement levels, especially for poor, minority, and immigrant children. They believed that this point of view, evident in many of the basic skills programs described and discussed in the conference, grew out of certain powerful but unspoken assumptions about the learning potential of such children and the professional effectiveness of their teachers.

Meeting and corresponding over the next several months, the association leaders identified and discussed some of these assumptions. It was out of this questioning and sharing that the decision to develop a position statement, representing the collective view of those professional organizations, emerged. Five of the assumptions, all common to basic skills programs across the country, are included here, each with the common-sense response that guided the development of "The Essentials of Education."

Assumption #1. *The basic skills are reading and computation.*

Response. Teachers of reading and the English language arts know that students cannot achieve mastery in reading without instruction and practice in all of the interrelated language activities. Their overall goal is to develop in students the ability to communicate effectively in a variety of situations through spoken and written language.

Similarly, mathematics teachers agree that the "basic" competency in mathematics is not simple computation. Students must develop their capacity to use reasoning, to manage ideas, to gather and organize information, and to see the relationships among related items.

The basic skills — keys to other learning and to intellectual development — are the skills of "using language and other symbol systems" (including reading, written and oral language, mathematics, the visual arts, and musical notation) and "the ability to reason" (for example, in problem solving, applying scientific principles, comprehending text, and writing), and they are best taught and learned in the context of significant content.

Assumption #2. *The basic skills of reading and mathematics have to be mastered at a "minimum competency" or "grade-equivalency" level before students have time or ability to study literature, sciences, arts, and humanities.*

Many students who are taught in programs based on this assumption are given sharply limited access to literature; they read "reading exercises" and controlled vocabulary readers instead. Science courses for these students may be reduced in scope and content because it is assumed that they need to spend more time in mastering skills before they attempt to read science textbooks. The arts and physical education activities are also likely to be reduced to make way for longer periods of reading instruction.

Response. All of us know that we learn to read, to communicate, and to work out problems as we deal with ideas and information that are interesting and important to us. Many "remedial" programs ask students to learn skills before dealing with content. Many "remedial reading" students continue in their pattern of failure or of minimal (and often temporary) mastery because the teaching is not connected to their personal need to know answers, to enjoy honest intellectual achievement. Planned use of language — spoken and written — would provide the needed practice in communication skills, while giving these students access to the literature, arts, sciences, and technologies of their world.

Assumption #3. *Children of these socially different groups, that is, poor, minority, and immigrant children, are less able to master the basic skills and less interested in learning. They differ in these ways from their age-mates in more favored socioeconomic groups and from earlier immigrant groups.*

Response. Most of these students actually demonstrate a high level of communicative competence — even loquacity — in their home language, using familiar linguistic styles and structures. Many of them are more successful, too, at understanding the language of their teachers than their teachers are at understanding the speech and writing of these students. We can learn from our students to use more fully our own natural capacity for understanding and communicating across barriers of language and culture.

Basic problem-solving skills are demonstrated in many ways as these young people develop life skills that sustain them in complex and difficult situations, making it possible for them to survive in environments that are often alien, unsupportive, or actively hostile. These problem-solving skills will serve these children well in their efforts to acquire the structured competencies of mathematics.

Assumption #4. *With limited resources for public education, it is necessary to choose between teaching the basic skills and teaching such "frills" as the arts and such "advanced studies" as the sciences and technologies.*

Response. In fact, neither skills nor "frills" can flourish in the absence of the other. Children learn what is interesting to them, what fills them with wonder, and what provides them with a growing sense of control over their lives and their environment.

Assumption #5. *The children of the poor and of minority groups are best trained for a restricted range of vocations, for specific jobs rather than for changing, expanding, life-long careers.*

Response. Many of these children are actually able to reach levels in their careers beyond any that their parents or teachers could imagine for them. These children need to have the opportunity and encouragement to imagine and to dare to do new things, to develop a clear sense of the future and of their own possible role in it. Literature, the sciences, and physical education can all play significant roles in this exploration of self for these children; they must be encouraged, through these disciplines, to test their own powers and possibilities.

* * * *

Building on the discussion of issues such as these, the association officers and their successors worked over the next two years to develop a statement on which they could obtain agreement from the members of their organizations and which their members would be willing to support actively. During this period of time, the number of subscribing associations grew from an original half dozen, mainly in the basic skills areas, the arts, and the sciences, to sixteen, representing a full range of instructional, supervisory, and administrative educators. In 1981, this number has grown to twenty-three. The full text of "The Essentials of Education" is on the next page.

Organizations for the Essentials of Education

The officers and staff executives of the subscribing associations have met and worked together since 1979 as *The Organizations for the Essentials of Education*, with the 1980 president of the National Council of Teachers of English, Alan Purves, serving as first chairperson. Task forces have been organized, within this coalition group, to carry out the purposes of expanding the national dialogue on what is essential for a balanced education, and to influence educational practice and supporting legislation throughout the country. The subscribing associations are listed below:

American Alliance for Health, Physical Education, Recreation and Dance
American Council on the Teaching of Foreign Languages
American Theater Association
Arts Education and Americans, Inc.
Association for Education Communications and Technology
Association for Supervision and Curriculum Development
Association of American Publishers
Council for Basic Education
Home Economics Education Association
International Reading Association
Modern Language Association
Music Educators National Conference
National Art Education Association
National Association of Elementary School Principals
National Association of Secondary School Principals
National Business Education Association
National Committee for Citizens in Education
National Council for the Social Studies
National Council of Teachers of English
National Council of Teachers of Mathematics
National Education Association
National Science Teachers Association
Speech Communication Association

As the work of the task forces and the activities of member associations have developed and expanded, dissemination concepts, activities to promote the statement, and a growing number of resources in print have contributed to certain manifest changes in the ways many schools are viewing basic skills. These changes have been expressed in a broader understanding of the interrelationships among basic skills and of the interdependence between skills and concepts. Some of the implications of "Essentials" concepts for curriculum and instruction are summarized below.

Implication #1. Title II ESEA legislation has redefined the basic skills to include written and oral communication as well as reading and mathematics. Programs funded under this legislation have been encouraged to refer to the redefinition of the basic skills which has been developed by the professional associations. The basic skills will be seen increasingly as communication competencies and reasoning competencies.

Implication #2. The expansion of the "reading in the content areas" approach to include the teaching of language and reasoning in all

The Essentials of Education

Public concern about basic knowledge and the basic skills in education is valid. Society should continually seek out, define, and then provide for every person those elements of education that are essential to a productive and meaningful life.

The basic elements of knowledge and skill are only a part of the essentials of education. In an era dominated by cries for going "back to the basics," for "minimal competencies," and for "survival skills," society should reject simplistic solutions and declare a commitment to the essentials of education.

A definition of the essentials of education should avoid three easy tendencies: to limit the essentials to "the three R's" in a society that is highly technological and complex; to define the essentials by what is tested at a time when tests are severely limited in what they can measure; and to reduce the essentials to a few "skills" when it is obvious that people use a combination of skills, knowledge, and feelings to come to terms with their world. By rejecting these simplistic tendencies, educators will avoid concentration on training in a few skills at the expense of preparing students for the changing world in which they must live.

Educators should resist pressures to concentrate solely upon easy-to-teach, easy-to-test bits of knowledge, and must go beyond short-term objectives of training for jobs or producing citizens who can perform routine tasks but cannot apply their knowledge or skills, cannot reason about their society, and cannot make informed judgments.

What, then, are the essentials of education?

Educators agree that the overarching goal of education is to develop informed, thinking citizens capable of participating in both domestic and world affairs. The development of such citizens depends not only upon education for citizenship, but also upon other essentials of education shared by all subjects.

The interdependence of skills and content is the central concept of the essentials of education. Skills and abilities do not grow in isolation from content. In all subjects, students develop skills in using language and other symbol systems; they develop the ability to reason; they undergo experiences that lead to emotional and social maturity. Students master these skills and abilities through observing, listening, reading, talking, and writing *about* science, mathematics, history and the social sciences, the arts and other aspects of our intellectual, social and cultural heritage. As they learn about their world and its heritage they necessarily deepen their skills in language and reasoning and acquire the basis for emotional, aesthetic and social growth. They also become aware of the world around them and develop an understanding and appreciation of the interdependence of the many facets of that world.

More specifically, the essentials of education include the ability to use language, to think, and to communicate effectively; to use mathematical knowledge and methods to solve problems; to reason logically; to use abstractions and symbols with power and ease; to apply and to understand scientific knowledge and methods; to make use of technology and to understand its limitations; to express oneself through the arts and to understand other languages and cultures; to understand spatial relationships; to apply knowledge about health, nutrition, and physical activity; to acquire the capacity to meet unexpected challenges; to make informed value judgments; to recognize and to use one's full learning potential; and to prepare to go on learning for a lifetime.

Such a definition calls for a realization that all disciplines must join together and acknowledge their interdependence. Determining the essentials of education is a continuing process, far more demanding and significant than listing isolated skills assumed to be basic. Putting the essentials of education into practice requires instructional programs based on this new sense of interdependence.

Educators must also join with many segments of society to specify the essentials of education more fully. Among these segments are legislators, school boards, parents, students, workers' organizations, businesses, publishers, and other groups and individuals with an interest in education. All must now participate in a coordinated effort on behalf of society to confront this task. *Everyone* has a stake in the essentials of education.

curriculum areas can be expected to be more widely supported in school organization. For example, Philadelphia, a major urban school district, now requires that each school develop an academic achievement plan based on "the teaching of the basic skills through all subjects of a balanced curriculum" (The School District of Philadelphia, 1980, p. 6).

Implication #3. Increasing attention must be given to understanding the language and cultures of those we teach, so that we can more accurately gauge the linguistic power and range of our students, and so we can plan to fully engage those abilities in our teaching. Ethnographic studies of language and learning support this work.

Implication #4. One of the best ways to conserve resources of time, staff, and funds is to maintain the natural interrelatedness of learning and interest. We are learning to draw on children's natural interest in how things work and how things grow. We are also becoming skilled in drawing on the astonishing quantity of sophisticated learning available to our students through television and other technologies. Out-of-school resources are brought into the schools in such programs as Television Reading, a program sponsored by Capital Cities Communications, Inc., in which the scripts of popular television shows are provided as reading material, with teachers' guides to support instructional use; Newspaper-in-the-Classroom, sponsored by the Educational Services Department of the Philadelphia *Inquirer*; and Parent Partnership, a comprehensive effort of the School District of Philadelphia.

Implication #5. The importance of attention to the physical environment and to the social context of learning is strongly supported by the "Essentials" statement and by the subscribing associations. School staffs can be reassured of their instructional importance by this consensus, and, best of all, neither of these is a cost item for schools.

Implication #6. Parents and teachers, as well as students, can gain a new sense of their own capacity to learn, grow, and change, and to see this learning as rooted in their own strengths and as defining their own changing roles in society. The concepts of life-long learning, continuing career development, and mutual interdependence are supported by the "Essentials" statement.

A Local Example

In Philadelphia, leaders of local affiliates have been meeting through 1980 to promote public understanding and discussion of "The Essentials of Education" and to increase the strength and effectiveness of their individual associations. Their work is guided by the principle on which the "Essentials" statement is based — the principle of interdependence.

Their first objective — to promote public understanding of the interdependence of elements in a balanced education for all learners — has led to a cooperative endeavor with a major public radio station, which emphasizes classical music. A series of three-minute public service announcements is being prepared for broadcast, each establishing a connection between the arts and specific elements of academic, intellectual, vocational, or career knowledge or skills. For example, music educators, librarians, and teachers of reading and English may suggest to parents selected literature for children and young people — literature related to music and the arts. Teachers of the language arts, mathematics, science, physical education, business education, social studies, foreign languages, and the arts are working on the project, with help on production from teachers of communication technologies. All are rediscovering their own professional interdependence as well as the interdependence of their teaching specialties in the schools.

The second major objective of this local "Essentials" consortium is to develop mutually supportive programs in professional association leadership. Officers of the associations have cooperated in the preparation and presentation of official statements at meetings of groups concerned with legislation, funding, and support of education. For example, presentations have been made before the local Board of Education, at the state department of education, and at regional public hearings on regulations of the Department of Education.

In addition, the officers of these associations are developing plans for leadership development workshops that will provide opportunities for sharing ideas, especially about successful practices designed to increase the number of members in the association and to inspire members to be active in the association's activities. In this effort, as in their cooperative effort to promote "The Essentials of Education," officers see an opportunity to involve teachers in their own career development. Teachers will make the decision to participate in these associations when they see clearly that this work will help them teach more effectively and with greater personal satisfaction, and when they realize that the associations will work actively to effect needed changes in the conditions of their work and in the attitudes of their colleagues and students.

The overriding purpose of the local consortium is to provide a structure through which professional groups can practice, disseminate, and expand the shared understanding of how education can best serve this changing society. Its central concept of interdependence is essential not only for real learning in the schools but for the building of the human community, which is the ultimate goal of education.

Conclusion

The word *essentials* was chosen by the first group of planners after much reflection and discussion. It is intended to convey an understanding of the *essence*—the *being*—the *nature* of learning—meaning—order—making connections among separate elements of experience, shaping our own lives, understanding our personal power to experience our lives fully, and realizing the opportunities we have to contribute to the lives of others.

"The Essentials of Education" is an evolving redefinition of education as a comprehensive social process, involving all members of society as well as education professionals in ways that enhance the unique contribution of each to the interdependent community.

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State Leadership in Basic Skills

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Editors' Note: *John Meehan describes the development of a state program which coordinated reading, writing, and oral communication instruction. He uses four short case reports to illustrate the use and effects of the state program in schools and ends with a list of assumptions and recommendations based on their experience. As with the Ontario example in the next paper, Pennsylvania was chosen because of its efforts to coordinate instruction in basic skills. Although the author is describing activities in one state with its special traditions, staff resources, and staff beliefs, many of the principles underlying this state program are being used or can be used in other states.*

Any discussion of a department of education's role in improving basic skills must be placed in several contexts: the department's function as an arm of the executive branch of state government, its operational leadership as expressed in its working relationship with school districts, its response to national trends, and its administration of federal programs.

As an arm of the executive branch of the government a department of education ensures that school districts comply with the laws pertaining to education. These important regulatory responsibilities involve monitoring school district compliance with school law, but a rich tradition of communication with and assistance to school districts testifies to an important second role, service. The emphasis on service is reflected in the work of curriculum specialists, who publish curriculum guides, sponsor and conduct teacher and administrator workshops, and visit schools, not to conduct evaluations but to observe exemplary programs and provide consultant assistance.

With the "back to basics" movement and widespread criticism of public education, many state departments of education, disenchanted with service-style leadership, began developing lists of student competencies, competency tests, and graduation requirements, all dramatic steps toward a strong regulatory type of leadership. The Pennsylvania Department of Education has been influenced by this new leadership style and the national trends associated with the back to basics movement. Its response to both has found expression in four major efforts aimed at effecting school improvement, particularly in the area of basic skills.

In 1976 the Pennsylvania Board of Education announced its intention to revise the state's ten goals of quality education to emphasize basic skills. (The Educational Testing Service developed the original ten goals of quality education for the state in the mid-sixties. They resulted from a survey of business leaders, the public, and educators and clearly reflected the spirit of the sixties — the first goal was "self-esteem.")

In 1979 the revision task was completed (lists of the ten original goals and the twelve revised goals follow this paper). The first two of the new twelve goals addressed basic skills as defined by Congress in Title II of Public Law 95-561:

- Quality education should help every student acquire communication skills of understanding, speaking, reading, and writing.
- Quality education should help every student acquire skills in mathematics.

State Efforts to Improve Basic Skills Instruction

To assess achievement in each of these goals, the state developed a battery of tests for grades 5, 8, and 11 to provide schools with an idea of how they compare with other schools in the state as well as with schools that have similar community, socioeconomic, and educational profiles. At first, school districts participated voluntarily; recently the tests were made mandatory.

Two separate Department of Education projects reflect the national trend toward the development of student competency statements: Project 81 and the Student Outcome Project. The primary goal of Project 81, which began in 1976, was to identify life-role competencies, that is, competencies young people need to succeed as adults. Over a five-year period, ten model school districts and two intermediate units were to identify life-role competencies, build a curricular program to teach them, and explore alternative requirements for graduation. In 1979 the Department initiated the Student Outcome Project, which involved representatives from twenty-five professional organizations, Project 81, and the Department of Education in the preparation of a statement about the attitudes, knowledge, and skills students can be expected to acquire during twelve years of schooling. A working draft of these expectations has been completed. The final products of both projects will form the foundation for new curriculum regulations organized not according to traditional content designations but in terms of the twelve goals of quality education. It is not clear at this time whether the outcomes of these projects will also lead to specific graduation requirements.

These efforts, as well as the Basic Skills program discussed on the following pages, are being coordinated through the Department's newest leadership program, School Improvement. (Space does not permit a description of how this program came into being, but its role in linking previously separate projects and activities appears crucial in providing for effective state leadership.) The School Improvement Program requires each school district to develop a five-year, long-range plan with an action plan for each of its schools. Department staff have been assigned to school districts as field representatives providing both services and resources. This is a statewide coordinated effort to achieve quality education.

In addition to these four major efforts, Department staff are administering two federal programs: Right to Read and Basic Skills. These programs have provided content leadership in reading and oral and written communication for the Department. In response to Title II of the Elementary and Secondary Education Act (Basic Skills), a state plan was developed around two programmatic frameworks, one for mathematics and one for oral and written communication.

The School Improvement Program requires each school district to develop a five-year, long-range plan with an action plan for each of its schools. Department staff have been assigned to school districts to provide both services and resources. This is a statewide coordinated effort to achieve quality education.

The framework for mathematics has just been completed and is being distributed to school districts. The framework for reading and oral and written communication has been available since 1977 as the Pennsylvania Comprehensive Reading/Communication Arts Plan (PCRP).

History of PCRP

PCRP's development, implementation, and impact illustrates how federal leadership (Right to Read and Basic Skills programs) and state leadership, through its management of these federal programs, have provided and continue to provide school districts with services and resources that stimulate curriculum development and improvement.

In 1975 the U.S. Office of Education required that each state in the Right to Read program prepare and submit to Washington a comprehensive state reading plan. At first we were reluctant to do so. The task seemed gargantuan and superfluous, diverting us from other more important tasks. We obtained copies of other state plans to find out just what a comprehensive plan looked like. This further discouraged us because those we looked at were without exception huge compendia of systems, PERT charts, committees, objectives, competencies, and activities concerning reading that covered hundreds of pages of print. Two things particularly bothered us about these state plans. They focused solely on reading and did not address the other language arts of listening, speaking, and writing; and while apparently comprehensive, they seemed to lack a conceptual center. Thus, by looking at what others had done, we began to put together ideas concerning the content and format of PCRP. These ideas crystallized into four simple principles:

1. The plan would include all of the language arts, not just reading.
2. The plan would be written in a style that could be read and understood by any literate person.
3. The plan would address certain important educational issues, such as evaluation, testing, accountability, leadership, and curriculum balance.
4. The plan would be brief and it would be to the point.

In 1976, a consultant undertook the work of writing such a plan. He conceived of the plan as a framework and identified its goals as (1) to advance student competence in reading and listening and in oral and written expression, and (2) to nurture positive attitudes toward reading and the effective use of language. Excerpts from the plan are included here to provide readers with an understanding of the plan and of the role it plays in state leadership in basic skills.

> PCRP proposes processes for advancing its goals under the active leadership of the principal of each school in the state. Its main elements have considerable support from experimental and other research, but its implementation must be responsive to the uniqueness of each school.
>
> It is a plan of shared accountability — from administration to the staff, from the staff to administration, and from both to the students and community. The administration provides for the staff a flexible plan (PCRP) for continuous strengthening of the curriculum and the resources for implementing it, including materials and a staff development program. The staff, in turn, brings its collective energies and wisdom to implementing, evaluating and improving the program. The more limited notion of accountability as scores on a series of tests, with the teachers alone being accountable for improving them, has proven bankrupt in recent years and has damaged the collaborative potential of the administration and staff working in concert.

The schoolwide and classroom management objectives for both administrators and (by inference) teachers are set forth in PCRP's four major categories of action:

1. The institution or improvement of preschool through adult reading/communication arts curriculum based on four experiences (each using and cultivating the basic skills of listening, speaking, reading, and writing) which students cannot do without if they are to develop optimally the arts and skills of language:
   a. Responding to literature (heard, read, visualized, or dramatized)
   b. Sustained silent reading of self-selected books
   c. Composing: oral and written
   d. Investigating and mastering language patterns: sound/spelling, syntax, and meanings.
2. The institution or improvement of a curriculum-related and standardized test evaluation design for management of instruction: proper placement of students, diagnosis of student needs and measurement of student progress.
3. The institution or improvement of informal measures of student growth in interaction (talking together) skills, writing skills, study skills and positive attitudes toward reading.
4. The institution or improvement of systematic methods for obtaining teacher observations and evaluations as a prime basis for the continual evaluation and development of the curriculum.

The completed state plan (PCRP) is a 42-page document that has, since its publication, served as the philosophic foundation for all related educational programs, projects, and activities throughout Pennsylvania and within the Pennsylvania Department of Education.

On December 5, 1977, PCRP was introduced as a "working paper" at a statewide Right to Read conference, where it was analyzed and discussed by representatives from schools, colleges and universities, and professional organizations. After considering the many suggestions offered, we revised, edited, and then printed the plan for general distribution. After PCRP received the endorsement of the Commissioner of Basic Education, we conducted a number of inhouse seminars so that all department staff involved in basic skills programs were not only informed about PCRP but also had the opportunity to thoroughly understand it. We also involved department staff in a two-year information program aimed at introducing and explaining PCRP to all Pennsylvania administrators and teachers. This two-year effort included state conferences and workshops, as well as the redesigning of the state's Right to Read Leadership Training Program and its related technical assistance program. We further promoted PCRP by contracting for publications that expanded on key elements of the plan or that served as vehicles for examining curriculum and instructional materials according to the plan's principles and major categories of action.

Our work within the Department of Education brought people together and resulted in working relationships with other offices that had not existed before, including Early Childhood, Adult Education, and Title I.

Our work within the Department of Education brought people together and resulted in working relationships with other offices that had not existed before. The Early Childhood Office employed PCRP in both its workshops and its publications. The Adult Education Office engaged us in their planning and workshops and distributed PCRP to all its adult basic education centers. Title I staff were interested in but skeptical about the use of PCRP curriculum programs with Title I children. Together our offices planned an effectiveness study in six Pennsylvania schools. In the study subskill instruction is deemphasized, and Title I teachers are trained to instruct their students in oral and written communication as well as reading. They build their instructional program around the four critical experiences of the plan. To date results have been promising. Eventually PCRP should effect major changes in Title I instructional programs.

PCRP in the Schools*

Since the introduction of PCRP late in 1977, hundreds of school districts throughout the country have implemented all or some of the plan. This year our state directory lists over one hundred PCRP schools. Three implementation reports are described below (two from districts and one from an intermediate unit). Each of the authors of these reports played a major role in the activities they describe.

PCRP in a small rural district. This small rural community is located in northwestern Pennsylvania, far removed from the Department of Education.

> Our initial introduction to PCRP was at a Right to Read Academy on Curriculum conducted by the Department. When a staff member from the Department suggested the possibility of being in our area, we asked for an informal presentation to our superintendent and to selected staff. Sustained silent reading, the second critical experience, was selected as the goal to be implemented in grades kindergarten through twelve the next year.

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*The following persons contributed accounts of district activities. Because of space limitations, the editors were not able to include all of them: Dr. Heidi Gross, Reading Supervisor, Norristown Area School District, Norristown, PA; Dr. Patricia A. Guth, Administrative Assistant for Curriculum, Penridge School District, Perkasi, PA; Evelyn E. Kahle, Director of Elementary Education, Kane Area Elementary School, Kane, PA; Dr. Marion Rosecky, Project Director, Project CARES, Chester County Intermediate Unit #24; and Fran Sabo and Andrew Zahratka, Directors of Language Enrichment Activities, Norwin School District, North Huntingdon, Irwin, PA.

Embracing the plan's underlying concept, which suggests that children learn by doing based on past experiences, we could easily move toward a learning model encompassing the holistic approach.

A state Right to Read Conference enticed us to pursue the plan, and an administrator at each level took a course on PCRP implementation at the University of Pennsylvania. As a result of this training, all teachers in the district were exposed to the plan. Because the state had given us the option of implementation, it seemed wise to give that choice to teachers. Approximately half the volunteers solicited at the elementary level chose to implement the program.

The goal of the first group was to learn as much as possible about the four critical experiences and to incorporate each of these on a daily basis as soon as feasible. This group chose to meet every other week after school for instruction and sharing. These sessions of administrators and teachers working together over an extended period have proved beneficial to the success of the program as well as to total staff development.

At the start of our second year, another group of interested teachers was invited to join us. Because of the influence and success of the program, nearly all teachers are now involved.

PCRP in a medium-sized, semi-rural district. This district of 5570 students and 344 professional staff is located in a semi-rural community. The district's efforts to implement PCRP took place between 1978 and 1980.

The district's Administrative Assistant for Curriculum reviewed PCRP prior to its final draft. When PCRP was disseminated by the State Department of Education, the administrative assistant conducted awareness sessions for all administrators, department chairpersons, and reading staff members. They indicated a commitment to provide leadership and support for the development and implementation of the program in the district. Awareness sessions were also conducted for the staff members of each building.

A district task force was organized to plan the implementation of PCRP in the district. The task force, composed of two elementary teachers, three secondary teachers, a reading teacher, the language arts supervisor, and the administrative assistant, participated in a Right to Read Academy sponsored by the State Department of Education during February 1978. The task force planned the integration of the four critical areas of the PCRP into all areas of the school curriculum.

In May 1978 the task force surveyed the total staff to determine those skills considered important in each of the four critical areas. The survey indicated that the critical areas were included in various phases of the instructional program. A needs assessment was then conducted to determine the teachers' perceptions of the students' performance and of the need for staff development programs. The results indicated a need for inservice training in the areas of composition skills and study skills. During the summer of 1978, the task force prepared materials which provided specific directions for all staff members in each curriculum area regarding the teaching of composition and study skills.

During the 1978-79 school term, staff development activities involved developing an in-depth understanding by all staff members of PCRP and of the district's plan. Suggested strategies for teaching composition skills and study skills were disseminated to all staff members. On November 10, 1978, a staff development program on implementing PCRP was conducted for all staff members, during which eight consultants presented workshops on effective strategies for teaching communication skills in all areas of the curriculum. All administrators received specific training in the teaching and supervision of language arts through the county intermediate unit's Right to Read program.

In 1979 staff members were trained in the Individualized Language Arts Program, which is aimed at improving written composition skills. The content area teachers were trained in strategies in the teaching of reading and composition designed to improve students' achievement in the content areas through language arts skills.

The task force for PCRP meets on a regular basis to evaluate progress and plan activities for fully implementing PCRP.

PCRP in an intermediate unit. This county intermediate educational unit serves a total of twelve districts and ninety-nine schools encompassing urban, suburban, and rural areas. The intermediate unit has developed a program to support the implementation of PCRP and is piloting it in seventeen schools. The intermediate unit staff offers a wide range of services to teachers to support their teaching of the four critical experiences.

Planning and implementing PCRP activities in each pilot school is done through a building leadership team. The building principal, several teachers, reading specialists, and others serve on the team and provide leadership in their building. In the first year of the anticipated five-year project, the teams developed their own individual school plan, attended three Leadership Academies and a thirty-hour inservice course on PCRP, were provided with weekly support services from the CARES (Communication Arts Resources and Educational Services) staff, and kept a log of activities, problems, and successes.

Each school team was unique in the ways it involved the students, faculty, and parents. One school set up a schoolwide program of sustained reading and writing. The team brought in district administrators to read literature aloud to students to emphasize the value and importance of daily reading, and they set up a school "publishing house" to encourage student pride in writing. Many pilot schools have "adopted" another school to help that school implement PCRP.

Among the many results obtained in this first year through extensive documentation and evaluation, several important features emerged:

1. Students improved their competencies and attitudes in reading and writing when exposed to PCRP activities by enthusiastic, informed teachers.
2. The implementation process (using the building leadership team approach) can work in almost any school setting. Initially, secondary schools have greater difficulties in adapting PCRP to school schedules and philosophies.
3. The principal's leadership is crucial to successful implementation. It is the principal's commitment to and understanding of the underlying philosophy of PCRP that determines success in making long-term curriculum changes.
4. Using the PCRP holistic framework to improve instruction in reading and writing provides an effective way to authentically integrate the language arts in all grades and in all subjects.

The most important finding, however, may be that PCRP implementation, through state and intermediate-unit efforts, has brought about a much-needed cooperative effort of students, parents, teachers, principals, community groups, state and regional educational agencies, and university faculty toward the common goal of improved basic skills for all students.

Assumptions and Recommendations

The planning and implementation of PCRP, as described above, has served to emphasize crucial assumptions relating to administrators, teachers, students, the school environment, and the community. Briefly stated, they are as follows:

- Principals are the curriculum leaders of the schools they serve. They shape the program with their teaching staff. They know and understand what is happening in classrooms. They are directly involved with planning inservice and, through inservice, keep themselves abreast of theories, research, promising practices, and successful programs. They participate in and endorse all decisions related to their school's educational program.
- Quality education depends on how well teachers make use of the resources students bring to the learning situation. These resources include their language, attitudes, understandings, perceptions, and study skills.
- As they mature, students take on increasing reponsibility and initiative for their own learning. They are actively involved daily in reading and writing so that these activities become habitual, part of the pattern of their daily lives.
- The school and its classrooms make up the physical environment where formal education takes place. To establish an appropriate learning environment requires more than just adequate facilities and educational interior decoration. The commitment of the principal, teachers, students, and community must be pervasive, not only in classrooms but throughout the whole school. It must exist in the communication styles employed by teachers and students among themselves and with each other. The school must be a community of learners.
- Community and parents are informed about and participate in school programs. Without community insistence a school will not realize a quality program. That insistence will not be forthcoming if the community is not thoroughly informed and continually involved in ways that foster pride, commitment, and open discussion. Parents understand the school's program and extend and support it at home by their own commitment to reading and writing and to assisting their children when they are in need.

The leadership role of the Pennsylvania Department of Education in basic skills as it has evolved from our Right to Read program and PCRP can best be expressed by the following five principles.

First, state leadership and service should rarely take the form of a mandate; rather it should focus attention on key curricular and instructional issues in a manner that fosters discussion, inquiry, experimentation, and research. The role of the Department of Education is to create dynamic centers of thought and action through the kinds of assistance that make schools more responsible, more independent, and better able to pursue their goals without specific direction from above.

Second, school districts and the communities they serve have the final responsibility for providing a quality education for their children. This responsibility finds its concrete expression in each school building and in every classroom.

Third, quality education is more than the sum of the courses offered. It is a program whose wholeness is evidenced in each of its parts and their interrelatedness, especially in the basic skills. In such a program students have some sense of how each course has a part in helping them realize the goals their school and community have established for them.

Fourth, basic skills will not be mastered if they are taught only in some classes by some teachers and reduced to a number of subskills. A quality basic skills program recognizes the interdependence of skills and content. Specifically, reading, listening, and the effective use of language must be attended to across the curriculum, not only as skills to be taught but as skills to be applied in the learning of the content of all disciplines.

Fifth, literacy involves more than becoming an astute consumer or reading at the fifth-grade level. Literacy involves ability in and regular application of each of the language arts. Literacy is possessing the skills and attitudes needed to further oneself.

These principles cannot be ignored if states are to achieve effective educational leadership. The way they conceive of basic skills and their place in the curriculum, the way they define literacy, the degree of their commitment to quality education for everyone, and the way they perceive their leadership role will dramatically shape the destiny of public education in the 1980s.

Pennsylvania State Department of Education

The Twelve Goals of Quality Education

Preamble

The constitution of the Commonwealth of Pennsylvania states, "The General Assembly shall provide for the maintenance and support of a thorough and efficient system of public education to serve the needs of the Commonwealth." This provision mandates a quality education for each child in the Commonwealth.

The schools have the primary responsibility for the achievement of the goals of quality education as established by the State Board of Education, but they must work in close and continuous cooperation with the family, community and other appropriate social, religious and governmental institutions to insure the highest possible achievement of the goals.

To foster achievement of a quality education, the school environment should be safe, attractive and orderly, promote a willingness to work for objectives, stimulate a readiness to continue learning throughout life, and encourage the fullest possible educational development of each student.

To foster achievement of a quality education, the school program should reflect the following goals.

Goals

Communication Skills
Quality education should help every student acquire communication skills of understanding, speaking, reading and writing.

Mathematics
Quality education should help every student acquire skills in mathematics.

Self-Esteem
Quality education should help every student develop self-understanding and a feeling of self-worth.

Analytical Thinking
Quality education should help every student develop analytical thinking skills.

Understanding Others
Quality education should help every student acquire knowledge of different cultures and an appreciation of the worth of all people.

Citizenship
Quality education should help every student learn the history of the nation, understand its systems of government and economics and acquire the values and attitudes necessary for responsible citizenship.

Arts and the Humanities
Quality education should help every student acquire knowledge, appreciation and skills in the arts and the humanities.

Science and Technology
Quality education should help every student acquire knowledge, understanding and appreciation of science and technology.

Work
Quality education should help every student acquire the knowledge, skills and attitudes necessary to become a self-supporting member of society.

Family Living
Quality education should help every student acquire the knowledge, skills and attitudes necessary for successful personal and family living.

Health
Quality education should help every student acquire knowledge and develop practices necessary to maintain physical and emotional well-being.

Environment
Quality education should help every student acquire the knowledge and attitudes necessary to maintain the quality of life in a balanced environment.

Pennsylvania State Department of Education

The Original Ten Goals of Quality Education

Self-Esteem
Quality education should help every child acquire the greatest possible understanding of himself or herself and appreciation of his or her worthiness as a member of society.

Understanding Others
Quality education should help every child acquire understanding and appreciation of persons belonging to other social, cultural and ethnic groups.

Basic Skills
Quality education should help every child acquire, to the fullest possible extent, mastery of the basic skills in the use of words and numbers.

Interest in School and Learning
Quality education should help every child acquire a positive attitude toward the learning process.

Citizenship
Quality education should help every child acquire habits and attitudes associated with responsible citizenship.

Health
Quality education should help every child acquire good health habits and an understanding of the conditions necessary for maintaining physical and emotional well-being.

Creative Activities
Quality education should give every child opportunity and encouragement to be creative in one or more fields of endeavor.

Career Awareness
Quality education should help every child understand the opportunities open to him or her to prepare for a productive life and help each child to take full advantage of these opportunities.

Appreciating Human Accomplishment
Quality education should help every child to understand and appreciate as much as possible of human achievement in the natural sciences, the social sciences and the humanities and the arts.

Information Usage
Quality education should help every child to prepare for a world of rapid change and unforeseeable demands in which continuing education throughout adult life should be a normal expectation.

Forward to the Basics — Ontario Style

James R. MacLean
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Editors' Note: *In a search for programs in which basic skills instruction is coordinated throughout the curriculum, we learned of work being done in the Province of Ontario. In this paper James MacLean provides background and rationale for including educational experiences in which students simultaneously increase their knowledge of several of the basic skills as well as other instructional content in coordinated instructional experiences, often focused around problem-solving situations. He also reviews Ontario's experience in planning with parents and professionals for curriculum revisions. These revisions, planned over a two-year period, were based on the beliefs that different children learn differently and that living in today's society requires adaptability and capacity to analyze and solve problems — skills often not seen as educational priorities.*

Parents have expressed concern about the behavior, the attitudes, and the skills acquired by their children in schools since the time of the ancient Chinese, Greeks, and Romans. Parents today are no less concerned. Alarmed about the apparent deterioration of the basic skills, parents are placing increasingly heavy demands on the schools for a more effective educational system.

But what is the responsibility of the schools with respect to these concerns? Parents' judgments are often based on vague memories of their own school experiences; they assume that a more efficient application of the principles popular when they were young will provide the best education for their children. In crises, too many parents, and school administrators and teachers as well, tend to want to emphasize the practices that caused the difficulty in the first place.

The fact is that the school's responsibility is to prepare students to live in today's society. Adaptability and the capacity to analyze and solve problems have not been educational priorities in previous generations. They are now (Ontario Economic Council, 1976). We cannot hope that such skills will come naturally to our citizens as they reach adulthood — these skills are difficult and painful for adults to learn, because they require an entirely new way of thinking. It is during the preschool and school years that children must develop and sharpen these complex skills, which are basic for survival in our rapidly changing environment.

Over a period of seven years, the government of Ontario has attempted to reshape its school system to meet the challenge of the twenty-first century. With a school population of just under 2 million and a teaching force of about 100,000, organized into some 150 school districts spread throughout the province (415,000 square miles), the task of designing and implementing substantial curriculum changes was a formidable one.

The Process of Change

For generations Ontario schools were organized on the "getting ready for" principle — grade 13 readied students for university; grade 12 prepared them for grade 13; even kindergarten was designed to get children ready for grade 1. In 1970 the Ministry of Education announced its intention to begin a major updating of its curriculum policies, beginning with the primary and junior divisions of the school system (children 4 to 12 years of age) and followed by reviews of the programs in the intermediate division (students 12 to 16 years of age) and the senior division (16 to 19 year olds). The first tasks were to collect data on then current practices in the schools and on the expectations of parents and the general public and to identify trends in other provinces and countries.

A multimedia presentation designed to elicit reactions and to stimulate recommendations was shown to over 700 audiences of students, teachers, administrators, parents, trustees, and university and teacher college personnel within a period of two years. Simultaneously, research contracts were awarded to the Ontario Institute for Studies in Education and to other investigators to collect information on elementary school curricula in Ontario and elsewhere.

Next came the formation of the largest and most representative curriculum committee ever organized in the province. Sixty people, including teachers, principals, superintendents, parents, and college and university professors, were appointed to analyze and interpret the data collected and to revise the curriculum guidelines, develop appropriate support materials, and design strategies to implement their recommendations.

Organizing the large committee so that the energy and expertise of each member could be efficiently applied to the task was a major problem. In addition, the pressure of deadlines and the fact that school personnel serving on the committee were given only fifteen days of release time made it clear that full-time Ministry personnel would have to be responsible for much of the coordination and synthesizing of data. Five education officers were assigned to draft reports and to make revisions after each curriculum committee meeting. Paralleling the development work, an ongoing publicity campaign informed the public of proposed changes and the reasons for them. The committee presented its report to the Deputy Minister of Education in March 1973.

In 1975, after a series of validation exercises and further revisions, the Ministry officially released the material in two documents. *The Formative Years* set out the goals of the new program and the Ministry's expectations of local school districts with respect to those goals. *Education in the Primary and Junior Divisions* provided an extensive philosophy and rationale for the program and described how the goals might be achieved in an integrated and child-centered framework. The government of Ontario pledged to support an educational program that enabled each child to pursue education with satisfaction and to share in the life of the community with competence, integrity, and enjoyment.

Rationale for a New Curriculum Model

In the *Report of the PJ Curriculum Revision Committee* (1975), the curriculum revision committee outlined four assumptions on which their recommendations were based:

> 1. Curriculum is a cycle or complex system in which every part depends on the other and is concerned with all those experiences of the child for which the school is responsible.
> 2. A curriculum guideline is a plan or map for the teacher, not a course or a program. It provides the rules but does not dictate the variety of moves that may be made.
> 3. Principals and teachers, within the framework of general aims and objectives, must have freedom to decide what is best now for the pupils in their classrooms, with regard to the choice of specific objectives, materials, learning experiences, instructional methods, and evaluation procedures.
> 4. Many sectors of the community must be involved in defining the overall objectives of the curriculum and in assessing its outcomes for children and for the community. (p. i)

After intense deliberation on such questions as *why* we offer certain content and experiences, *what* content should be identified, *how* it should be organized, *when* it should be presented (timing and sequence), and *where* facilities and equipment were needed, the committee decided not to use the Tyler curriculum-development model (Tyler, 1950), which it had been considering, and designed instead a model which represents a powerful strategy for developing a curriculum appropriate to young children's needs (Figure 1*).

As shown in Figure 1, the building of a curriculum is a complex process involving interrelated and carefully balanced components:

- *Aims and objectives* are based on knowledge and beliefs about children's and society's needs and the school's role in meeting those needs.
- *Content* reflecting the aims and objectives is selected from the environment and exists to provide significant learning experiences. It is much more complex than subject matter or textbook.
- *Teaching/learning processes*, derived from the content, involve the child and the teacher with the content in that dynamic, reciprocal relationship that is in fact the only real curriculum. The critical significance of the way in which children in the primary and junior divisions think and learn led to the introduction of the subcycle of interaction: the child — nature and needs; the teacher — strategies and resources; and teaching/learning processes.
- *Assessment of outcomes* is concerned with the effectiveness of the decisions made and actions undertaken in the teaching/learning experience as well as with the appropriateness and relevance of objectives.

In view of the model developed, there seems little purpose in describing the content only in terms of the traditional subjects, which are often arbitrary divisions of knowledge that cut across kinds and levels of learning and do not account sufficiently for children's needs, interests, and styles of learning. Too often, the subject approach separates the skill from the idea, or the learning from the application in real-life situations. In extremes, the child can come to believe that learning is simply a series of arbitrary activities.

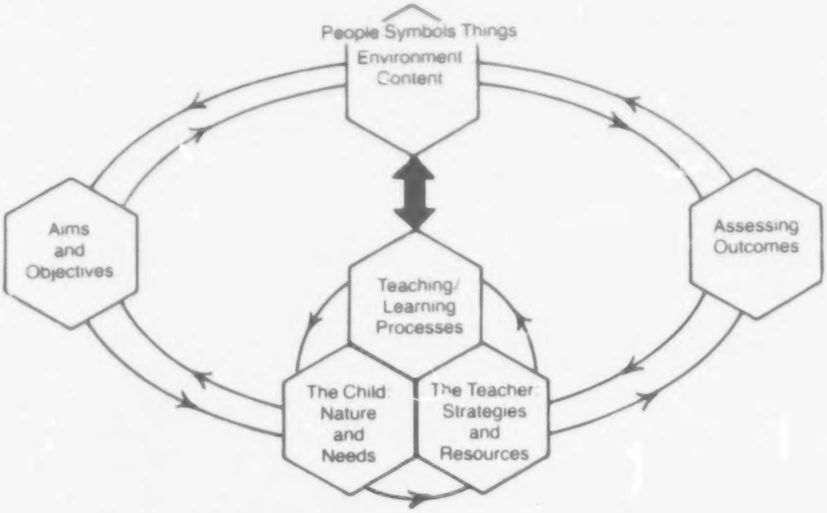

Figure 1. The many facets of curriculum building.

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*The figures used in this paper were developed by the major authors of the *Report of the PJ Curriculum Revision Committee*: Mr. James R. MacLean, Miss Sylvia M. McPhee, and Dr. Griffith Morgan. The copyright for the figures is held by the authors.

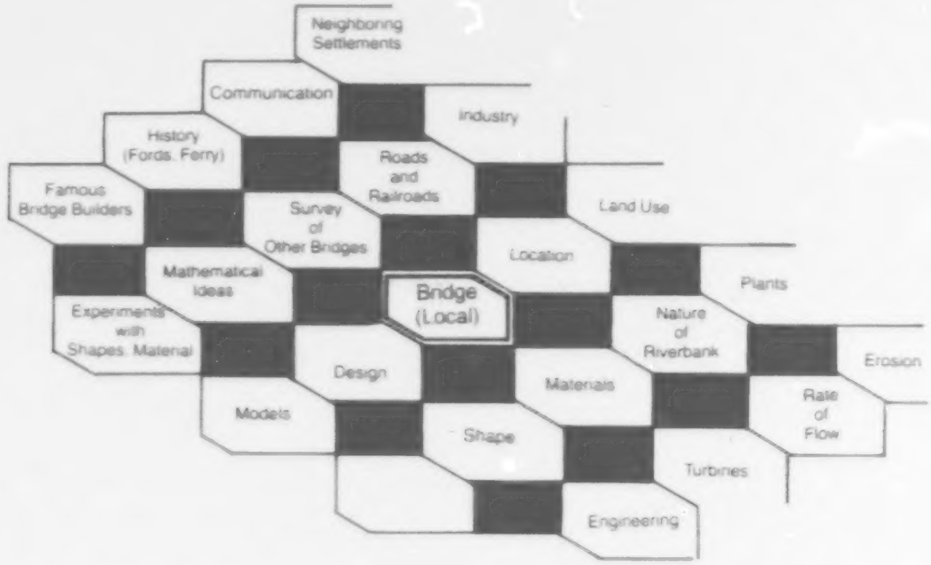

Neighboring Settlements
Communication
Industry
History (Fords Ferry)
Roads and Railroads
Famous Bridge Builders
Survey of Other Bridges
Land Use
Location
Mathematical Ideas
Bridge (Local)
Plants
Experiments with Shapes, Material
Nature of Riverbank
Erosion
Design
Materials
Models
Rate of Flow
Shape
Turbines
Engineering

Figure 2. Web of related knowledge.

Children learn because of their own purposes and interests. They learn major concepts, skills and strategies, and themes and topics that bridge "subjects" and "areas of knowledge." Children observe, discriminate, classify, order, judge, and estimate. They listen and talk. They evolve their own communication, symbolism, and language forms and acquire more effective ones. They make factual observations of their environment; try out experiments on their own terms; apply their knowledge of location, place, shape, measurement, and number; and discuss what they are doing with teachers or with friends. A child dealing with a topic in environmental studies or with a problem of measurement in mathematics draws on a wide variety of ideas, competencies, and ways of looking at the world in order to create a meaningful web of learning (Figure 2).

Children integrate learning, whatever the sequences or methods used. The *organization* of experiences can, however, help a child to see relationships and patterns in learning as well as the reasons for acquiring skills and when to apply them. Although a completely integrated program would be the ideal learning situation, the public and a sizeable number of teachers would not accept it. The committee chose to organize content into three major areas: communication, the arts, and environmental studies.

Communication includes the whole range of expressive and receptive language, symbolism, and graphic and numerical forms of communication. *The arts* involves activities that focus on the child's response to people and things and to the world of color, shape, sound, order, and pattern. *Environmental studies* introduces the child to the physical, biological, and social relationships of the world in time and space (structure, relationship, location, change). This includes the concepts and methods of science and mathematics, the study of sociology, geography, and history, and independent study and research skills. The child sees these, not as subjects, but as meaningful aspects of his or her interpretation of the environment.

Because the committee viewed curriculum as having reality only in the interaction between pupils and the learning enterprise and between pupils and teachers, the model stresses an interplay between the child's learning styles and the teacher's strategies and resources (Figure 3). By enlarging the teaching/learning processes cell (see Figure 1), we can list some of the forms of child-environment interaction and match these with the roles children assume in their learning. The interactions are ordered, roughly, from top to bottom on a scale from environment-dominated to child-dominated. Training, memorization, and imitation suggest major pressure from the environment, to which the child responds. Play, exploration, and experiment suggest primary initiative by the child in engaging the environment. The three interactions in the center suggest a balance between the two.

The significance of the teacher's role in the various forms of the child's interaction with the environment is demonstrated by extending the cell again to show the correlation between child roles, teacher roles, and outcomes (Figure 4). In addition, we can see how the assessment of outcomes completes — and begins — the teaching/learning process.

The Curriculum in Action

The Minister of Education expressed the Ontario government's commitment to the curriculum in this manner:

> The curriculum will provide opportunities for each child, to the limit of his or her potential, to (1) acquire the skills fundamental to his or her continuing education; (2) develop and maintain confidence and a sense of self-worth; (3) gain the knowledge and acquire the attitudes that he or she needs for active participation in Canadian society; and (4) develop the moral and aesthetic sensitivity necessary for a complete and responsible life. (Ministry of Education, 1975b, p. 4)

Determining the effect these goals should have on the daily experiences of children in our schools and identifying and assessing the necessary conditions for achievement of these goals is not easy. The goals are so interrelated that it is impossible to choose one and list the kinds of experience needed for its fulfillment. Also, a single learning situation can contribute to the achievement of several goals. The best approach may be to consider the characteristics of those schools that have demonstrated success in attaining the goals.

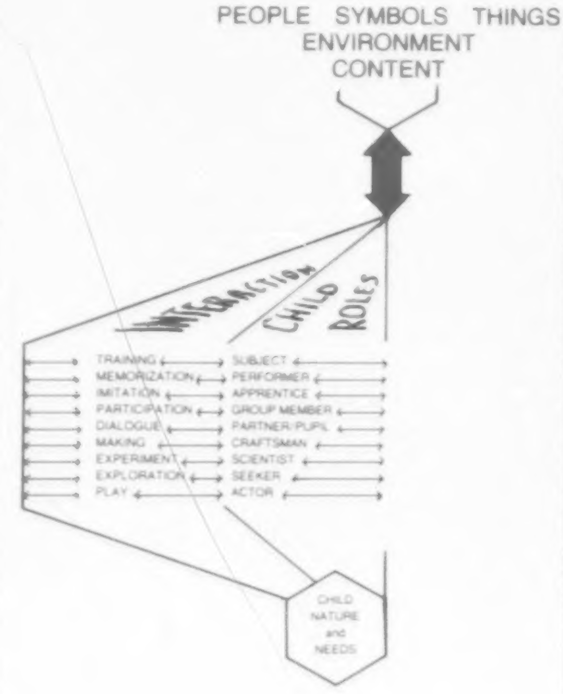
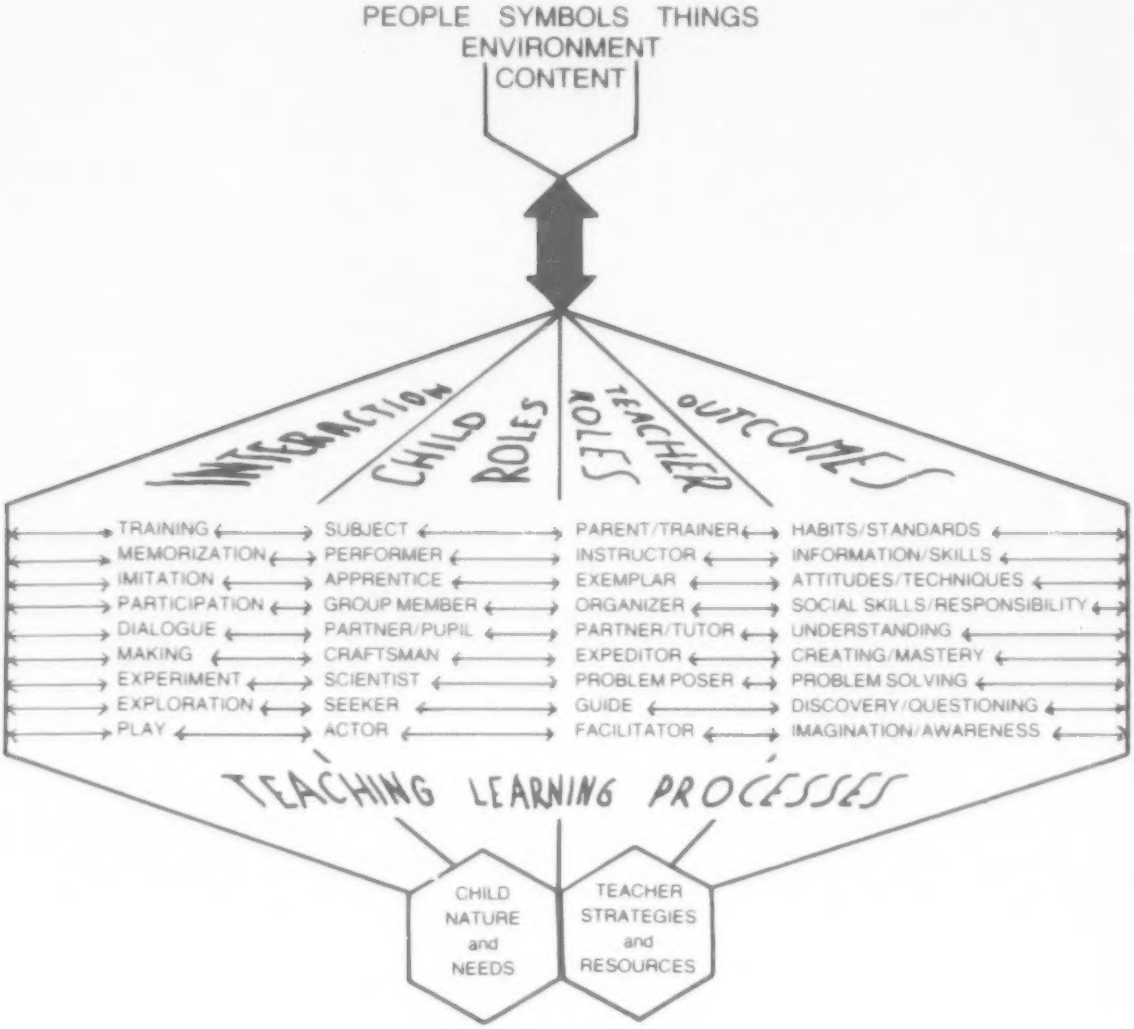


Figure 3. Interplay between child's learning methods and teacher's strategies and resources.

Characteristics of Good Schools

The school's first priority should be to acknowledge each child as an individual. This can be demonstrated in many ways. First, to know each child better there must be close and continuing liaison with the home. Not only must the teacher know about each child's out-of-school experiences in order to plan appropriate learning opportunities at school, but all those who care about the child can profit from sharing their observations and understandings so that the child's growth is aided by supportive adults with a common goal. Knowledge that preschool experiences set expectations, motivate and reinforce individual styles of learning, and affect


PEOPLE SYMBOLS THINGS
ENVIRONMENT
CONTENT
INTERACTION
CHILD ROLES
TEACHER ROLES
OUTCOMES
TRAINING ↔ SUBJECT ↔ PARENT/TRAINER ↔ HABITS/STANDARDS
MEMORIZATION ↔ PERFORMER ↔ INSTRUCTOR ↔ INFORMATION/SKILLS
IMITATION ↔ APPRENTICE ↔ EXEMPLAR ↔ ATTITUDES/TECHNIQUES
PARTICIPATION ↔ GROUP MEMBER ↔ ORGANIZER ↔ SOCIAL SKILLS/RESPONSIBILITY
DIALOGUE ↔ PARTNER/PUPIL ↔ PARTNER/TUTOR ↔ UNDERSTANDING
MAKING ↔ CRAFTSMAN ↔ EXPEDITOR ↔ CREATING/MASTERY
EXPERIMENT ↔ SCIENTIST ↔ PROBLEM POSER ↔ PROBLEM SOLVING
EXPLORATION ↔ SEEKER ↔ GUIDE ↔ DISCOVERY/QUESTIONING
PLAY ↔ ACTOR ↔ FACILITATOR ↔ IMAGINATION/AWARENESS
TEACHING LEARNING PROCESSES
CHILD NATURE and NEEDS
TEACHER STRATEGIES and RESOURCES

language patterns enables the teacher to plan programs that take advantage of the home influence. On the other hand, understanding of the teacher's objectives for their child helps parents to reinforce and extend the learning taking place in school. This partnership in the process of education is vital to all students from the beginning to the end of their formal schooling.

From the appreciation of each child's individuality comes an understanding of his or her basic needs for security and a feeling of self-worth. Teachers should apply this understanding both to classroom organization and to their personal interaction with children. Several school environment features demonstrate this concern for the security and self-worth of children. First, there must be teachers who care for children and show that they care, by responding to each child's unique ability, physique, and personality. Acceptance, leading to the growth of mutual trust and respect, is the key to meeting these basic needs. It is shown in the objectives chosen, the tasks set, the materials available, and the rules applied. One outcome is that children are willing to risk uncertainty, to make mistakes and to learn from them. No longer are they threatened by the "right answer the first time" attitude that has handicapped effective education for years. An imaginative display of children's work, the choice of books and other learning materials, and the use of space both inside and outside the classroom all contribute to this essential teacher-pupil relationship. John Blackie describes it best: "The children feel free and relaxed and at the same time in the care of someone they respect and to whose authority they can trust themselves" (1964, p. 57).

All children do not learn in the same way. From the time they begin trying to make sense of their world, they exhibit different strategies for gathering information. Some strategies are reinforced by success; others are discarded or modified when found inappropriate for solving problems. Parents who have raised more than one child are well aware of the wide differences in temperament among infants. Children range from the very active — even diapering them is a challenge — to the docile and easy to manage; from the child whose rest and hunger periods are predictable and easily accommodated in the family schedule to the one who seems dedicated to disrupting any and every routine both day and night. The variations in attention, persistence, responsiveness, distractability, and adaptability of young children are well known. The challenge for adults is to create an environment that enables the child to interact so that these basic temperaments can be developed constructively. Out-and-out confrontation between adults and children commonly results in serious behavioral and emotional problems. The teacher has a major responsibility to find out as much as possible about children's basic natures, competencies, and learning styles when they come to school. Responsibility for meeting these basic needs must be shared by the school and the home.

Given these fundamental differences, it makes little sense to expect all children to learn to read, to learn mathematics, to learn to write, and especially to conform with the rules of the classroom in the same way and at the same time. And it is vital that the purposes of teacher-planned programs and expectations for each child be understood by the parents. This understanding cannot be achieved through report cards, parents' nights, or annual ten-minute parent-teacher interviews. Without a solid partnership based on genuine concern for the well-being of each child, schools and communities will continue to waste their energies blaming each other and creating additional anxieties for children. Ways to bridge the communication gap that so frequently exists must be found.

Assume that the school and the home have accepted the individuality of each child and have stopped trying to mold the child into that mythical "average" person or into the image of an older brother, sister, or cousin and that steps have been taken to shape an environment both at school and at home that accommodates different learning styles and personalities. The next step is to examine what motivates a child to learn.

Many parents and teachers think coercion gets results, that is, order is maintained, routines are automatically performed, the household or classroom is quiet. Parents and teachers must realize that children learn little of value from such experiences except how to please. Children raised this way do little that will help them explore and expand their own capabilities or develop the self-reliance and resourcefulness needed for the management of change in our society (see Manpower Services Commission, 1977; Ontario Economic Council, 1976; UNESCO, 1973).

Participation is a better way of involving children in learning. It allows them to invest part of themselves in the task. But participation cannot be unstructured, accidental, or "free choice"; it requires a very complex structuring of the process rather than the content. The following illustrates a simple learning activity sparked by a frequent happening in many families:

Child: Mom, may I have 35¢ for an ice cream cone?

Mother: Let me see if I have enough change.

Child: Oh, you have lots of money! I can see a quarter, four dimes, three nickels, and six pennies.

Mother: Now, show me how many ways you can put the money together to get the exact amount for the ice cream if I give you all this change.

This kind of response to a child's question will help the child *learn how to learn*. Almost any occasion can be used to stimulate thinking in children. In the case above, there is no single "right" answer. The situation, which is real for the child, gives the adult an opportunity to observe the child's problem-solving strategies and, with further questions, to lead the child to a deeper understanding of number and an appreciation of patterns. There need be no sense of failure or frustration, because the coins are on hand to be arranged as desired, and the solution does not have to be written down within a specified time. In short, all of the conditions necessary for meaningful learning are met. The situation is of interest to the child, is significant mathematically, involves real objects, requires some action by the child, allows for different levels of solution, builds on past experiences and leads to new and more powerful kinds of thinking, and encourages the growth of self-confidence, perseverance, and competence.

It must be admitted that we, as adults, have not often followed the interests of children in structuring learning situations. Believing that "father [mother, teacher, or some other significant adult] knows best!" we have neglected the most powerful motivating factor, one that is intrinsic to the child: curiosity. More than 2000 years ago, Plato offered this advice: "Enforced exercise does no harm to the body, but enforced learning will not stay in the mind." Donald Hebb of McGill University claims that "the brain craves information as the body craves food." This statement has been confirmed many times, both in formal research studies (see HMSO, 1967, pp. 128-150; Yardley, 1973, p. 29) and in daily interactions between observant adults and active, growing children. The challenge lies in applying this knowledge to planning and creating an environment — both at home and in school — in which real learning can flourish.

Many factors that schools can do little about influence children's learning. Foremost among these is parents' ambitions or their hopes for their children. Too often, this has been influenced or shaped by false assumptions about inherited intelligence, aptitudes, and personalities. Difficulty in mathematics, for example, may be excused because the parent also had difficulty with mathematics as a child ("Don't worry, I was never any good at it either."). Such a parental attitude assures that the child will carry on the family tradition.

Variation in intelligence accounts for less than 25 percent of the differences in achievement among students (Kellmer Pringle, 1969, p. 151). In addition, most of our assumptions about the capabilities of young people are based on crude measures of intelligence. Yet one of the most destructive outcomes of test scores is the thoughtless assignment of labels, such as "slow learner," "retarded," or even "dumb."

The influences that significantly affect the way children learn are (1) level of aspiration of the parents, (2) degree of acceptance felt by the child, (3) quality and kind of motivation, (4) efficiency of learning styles, and (5) general ability. All of these influences must be considered and applied in assessing the special needs of each child.

The Issue of Basic Competency

It makes good sense to structure learning situations that take full advantage of the major influences that affect children's learning. Although it is true that children learn to read by reading and learn mathematics by doing mathematics, the quality of such learning may be questioned. Examples taken from mathematics can illustrate the difference.

Traditionally, the notion of "arithmetic mean" or "average" has been described as "finding the sum and then dividing by the number of addends." In one experiment children were provided with short pieces of lumber, bricks, string, toy cars, and a stopwatch and were assigned the task of determining which car was the fastest. The children, about nine years of age, applied far more ingenuity and precision to this problem than the teacher anticipated. Having chosen the length of the lumber and determined the slope (two bricks under one end), they were not satisfied with merely one trial but carried out many. Several "judges" verified computations, and no unreasonable outcomes, such as a mean time greater than the slowest trial, went uncorrected. Tenths of a second, or decimals, were dealt with naturally without any previous formal instruction. Subsequently, both the length and the slope of the ramp were varied before the children were satisfied they had identified the fastest car. The amount of highly motivated practice with addition and with division, to say nothing of the thinking and understanding that occurred, would have been difficult to accomplish in any other way.

The influences that significantly affect the way children learn are (1) level of aspiration of the parents, (2) degree of acceptance felt by the child, (3) quality and kind of motivation, (4) efficiency of learning styles, and (5) general ability. All of these influences must be considered and applied in assessing the special needs of each child.

Contrast this with a common approach to teaching, that is, giving a few examples to develop the algorithm and then assigning a great deal of practice. The outcome, at least for many children, is mindless performance of a ritual, and fundamental misconceptions go unnoticed. For example, a student who multiplies ¼ by ½ and gets ⅛ as the answer is correct. However, if, when asked to identify the largest fraction, the student unhesitatingly answers ⅛ because "when you multiply you always make it larger," he or she has a serious misunderstanding of fractions.

Current practices designed to secure "minimum competencies" are of no help either. The tradition in mathematics teaching of regarding mistakes simply as things to be corrected must be abandoned. Mistakes, and even correct answers, should be taken as an invitation to explore the learner's thought processes. Only by removing the barriers created by these false interpretations can we ease the anxieties and frustrations that many students experience when dealing with mathematics.

Evaluation Policies

It has been more than ten years since any student in Ontario has been subjected to external examinations. At various times in this interval there have been waves of protest about dropping standards and the inability of graduates to demonstrate mastery of the basics. Despite solid research evidence (Ministry of Colleges and Universities, Ontario, 1977) that the marks presently provided by the schools are better predictors of success at university than our former grade 13 provincial examinations, "A" level scores in Great Britain, or college entrance examinations in the United States, pressures mounted for some form of provincewide assessment activity.

Careful investigation revealed that many of the evaluative practices both in the past and in other jurisdictions have served neither to improve educational policy nor to stimulate and extend student learning. There is little evidence, for example, that the mere introduction of large-scale assessment programs to allow simple comparisons of student or school performance will assist students, teachers, or administrators. At best the effects seem neutral; at worst, harmful. Ironically, many of these testing programs have not even succeeded in their initial intention of reassuring parents or reducing public criticism.

In November 1976 the Minister of Education announced a program, the Ontario Assessment Instrument Pool, to improve the ability of all those engaged in public education to perform the evaluative and reporting tasks for which they were responsible. One of the first steps was to provide a wide variety of assessment strategies that have been carefully prepared, tested, and refined to correspond to the goals and objectives of education in Ontario. Techniques are being developed to ensure that the data collected will be used wisely and efficiently to improve educational processes, whether these be individual student programs or the broad provincial policies that support and regulate such programs.

Banks of test items are to be a major component of the program. The guidelines for the new curriculum give teachers the necessary flexibility to adapt their programs to the needs of students. No single test or small group of tests in the conventional sense can match the flexibility of item banking. It allows the teacher, principal, or administrator to select the particular objectives to be assessed and provides test items designed for those objectives. Because the items will have been thoroughly pretested, they will be calibrated so that useful comparisons can be made between different groups of students. In addition, because not all important learning outcomes can be assessed by written tests, the Pool will contain other types of assessment instruments, including (1) methods for improving the reliability of classroom observations and structured interviews; (2) methods and reference materials that will provide standards for assessing student growth in areas such as listening, speaking, writing, music, and art; and (3) methods for assessing student growth in affective areas such as attitudes toward others, self-image, moral development, and self-discipline.

Every effort is being made to convince teachers that the Ontario Assessment Instrument Pool will be used to help them improve their judgments about student achievement and the quality of their programs. The Ministry of Education, of course, has the ultimate responsibility for ensuring the provision of appropriate educational services and for establishing the general nature of these services. The Pool will be used by Ministry personnel to monitor the effectiveness of provincial policies and programs and to make judgments about what further developments or refinements are necessary. Data for this latter purpose will be obtained from a representative sample of students rather than from all students in all schools. If, as intended, the Pool meets the needs of the various participants, the Ministry will not have to add to this any routine assessment of individual students for accountability purposes.

We hope that this policy on evaluation will prevent the repetition of other situations in which assessment procedures have effectively stifled what were promising curricular innovations. The inclusion of evaluation in the curriculum cycle and our attempt to make it compatible with programs that stress an integrated approach to learning may well enable us to succeed in developing schools that, in the words of James L. Hymes, Jr., "let a child be now the very most that a child can be, so that twenty years from now and all through his life he can be the very most a human can be" (1978).

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Learning in Real-Life Contexts

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Editors' Note: *One approach to coordination of instruction so that two or more basic skills are taught together is to arrange instruction around problem-solving situations. Such situations often also require learning science or social studies concepts. In this paper Betty Beck describes the development and use of curriculum focused around the solving of realistic problems. She discusses outcomes and some of the issues associated with initiating such coordinated instruction.*

In 1967 a group of highly respected educators, mathematicians, and scientists met in Cambridge, Massachusetts, to consider the possibility of integrating mathematics and science instruction in the elementary school. Participants stressed the importance of instruction that is relevant to the child's interests and needs:

> In applying the ... "scientific method" to interesting situations in everyday life, one may hope to remove some of the academic flavor of mathematics and science. The use of everyday situations may encourage children who resist abstraction or are impatient to see the relevance of what they are learning.... An integrated mathematics-science program should tend to make it feasible to have every child get most of his practice in arithmetic through handling numbers in which he has a real interest, that is, numbers which he has found in his own experimentation. (Cambridge Conference, 1969, pp. 30,13)

As a result of this conference, the National Science Foundation supported the documentation and evaluation of classroom use of the scientific method to solve students' everyday problems. This type of instruction became known as real-problem solving.

In the mid-1970s parent and community groups began demanding a greater stress on mathematics and language arts skills in the schools. Professional educators were concerned, because they also saw the need for continued emphasis on inquiry skills — skills that enable students to think critically and solve problems. The evaluation of real-problem-solving classes has shown that there is more effective learning of both mathematics and language arts skills and inquiry skills when students learn them together by dealing with real problems. This paper will elaborate on real-problem solving, indicate how mathematics and language arts skills, as well as inquiry skills, are learned within the context of working on real problems, describe the evaluation studies which have been completed, and suggest ways that real-problem solving can be included in the school program.

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Real-Problem Solving

Problem solving means different things to different people. For some, problem solving means finding solutions to the word problems found in most textbooks. For others, problem solving means working on hypothetical problems that may never really happen in real life or on problems presented as case studies that have no direct relation to students' lives.

Real-problem solving as described in this paper means student involvement in school or community situations they would like to see changed, for example, the school lunch program (students dislike the food, have to wait in line too long, or think the lunchroom is too crowded), traffic near the school, or theft or vandalism in the school. Working on such problems is highly motivational and requires a wide range of inquiry skills: defining the problem, deciding on avenues of investigation, collecting and analyzing data, communicating and making decisions, evaluating possible solutions, and implementing the chosen solution. This long-term process utilizes a wide variety of mathematics and language arts skills — skills that can be learned and practiced repeatedly as the students move from stage to stage within the process.

Dr. Robert Gagné defines cognitive skills as "the internal controls which make [the student] an efficient learner, an efficient 'rememberer,' an ingenious problem-solver." He states that these cognitive skills "are not learned quickly. . . . Instead, they probably undergo continued refinement and sharpening as the individual acquires greater experience . . . [A] teacher . . . must provide many opportunities throughout the course of instruction for [the student] to encounter, formulate and solve problems of many varieties" (Gagné, 1971, p. 522).

Real-problem solving has been used successfully at all age levels (Unified Sciences and Mathematics for Elementary Schools [USMES] Curriculum, 1976-1977). The students, not the teacher, choose the problem to be tackled, decide what factors need to be investigated, search out the facts, try out possible solutions, and judge the effectiveness of their results. Primary-grade students may work on problems such as finding the best way to the school library, the best way to pass out supplies or assign jobs in the classroom, or what animals can be kept successfully in the classroom. The type of investigations and the level at which they are carried out varies with the children's age and abilities. Likewise, solutions that are acceptable to the students vary with the sophistication of the students.

Skills Involved in Real-Problem Solving

Table 1 describes activities that may occur as students work on one or more aspects of a school lunchroom problem (USMES Curriculum, 1976), along with the inquiry skills and the mathematics and language arts skills learned and practiced during these activities. Not all classes will participate in all of the activities listed — the students decide which aspects of the problem are important to them and collect information only on those aspects.

The teacher facilitates the real-problem-solving process by providing time for discussion and small-group investigations, by asking questions to stimulate students' thinking and encourage comprehensive work, and by teaching specific skills as they are needed. The teacher also makes written resources available to help students with data collection and analysis (USMES Curriculum, 1977). In addition, people from the community can be asked to help the students with their work. In this example the school dietician, health organization personnel, architects, and others could be contacted.

Real-Problem-Solving Evaluation

The evaluation of real-problem-solving classes has focused on three areas: subject area skills, problem-solving processes, and student attitudes. The evaluation reported on here was carried out by groups at Boston University, the University of Minnesota, Michigan State University, and the staff of the USMES Curriculum project.

Subject area skills. Studies by evaluation teams from Boston University were based on pretest and posttest scores on a standardized test. In 1972-73 and 1973-74, comparisons on the Stanford reading comprehension and

Table 1. School lunchroom problem.

Activity	Inquiry Skills
In the initial session, students identify possible important aspects of the lunchroom problem (unpopular food, crowded tables, too long a wait in line, litter, etc.) Session may be repeated after observations and/or student questionnaire.	Identifying and defining the problem (LA, S, SS)
Classes may decide they need to find out what foods students prefer, what the state nutritional requirements are, how long students wait in line, scheduling of classes in lunchroom, etc.	Deciding on information and investigations needed (LA, S, SS)
Classes may be split into small groups to design and carry out the various tasks. As the groups report their progress to the class, students may see the need for new information (what foods are thrown out, nutritional value of different foods, measurements for a scale drawing of the lunchroom).	Organizing to obtain needed information (LA, M, S, SS)
Investigations carried out: (1) design and administration of student surveys, (2) interviews with dietician and lunchroom personnel, (3) research into nutritional values of foods, (4) interviews with principal, (5) measurement of waiting times, dimensions of room, tables, benches, etc., (6) counting of portions of different foods thrown out, litter on floor.	Questionnaire design (LA) Sample determination (M, SS) Interviewing (LA) Research (LA, S) Procedures design (S) Measuring (M, S) Counting, addition, subtraction, multiplication (M)
Data analyzed and reported to class: (1) bar graphs made and percentages calculated from data on surveys, food wasted, (2) histograms made and medians calculated of timing data, (3) interview and research data organized, (4) scale map made of lunchroom.	Graphing (M, S) Percentage calculation (M) Statistics (M) Organizing and reporting (LA) Geometry (M) Inference (M, S, SS)
After discussion, classes may present reports and recommend changes in food, lunchroom arrangement, or scheduling to the principal and obtain permission for a trial of proposed changes.	Report writing (LA) Communicating (LA) Setting up trials (S, SS) Data collection and analysis (M, S, SS)

LA, language arts; M, mathematics; S, science; SS, social science.

mathematics computation subtests were made between classes with real-problem-solving experience and classes with no experience. The 1973-74 results showed that most of the real-problem-solving classes attained somewhat higher posttest mean scores, adjusted for pretest differences, in both the reading and mathematics subtests (Shann, 1975). The 1974-75 testing included six subtests: reading comprehension, mathematics computation, mathematics application, mathematics concepts, science, and social science. On all six posttest measures the overall real-problem-solving class mean was higher than the overall control mean. Although these overall differences were small, the trend favored the real-problem-solving classes. In addition, the report on the 1974-75 testing points to an especially noteworthy trend "favoring real-problem-solving classes in the seventh and eighth grades. While the real-problem-solving group exhibited continued growth in each of the six subtest areas, the control group exhibited less growth or even showed a decline in performance" (Shann et al., 1975, p. 124).

Three other types of basic skills investigations in real-problem solving were made. At Michigan State University a nine-week in-depth study was made of every mathematical topic arising in four classes working on four different problems. It was found that almost every mathematics skill that could be associated with elementary school came up in the real-problem-solving context and that many came up frequently (Krairojananan, 1973). A study at the University of Minnesota compared students' knowledge of basic economics according to four treatment groups: real-problem solving, contrived-problem solving, discussion/workbook, and control. At the conclusion of four weeks, the Test of Elementary Economics was given to each group. Students in the two problem-solving groups had significantly (p .05) higher scores than the other two groups, with the real-problem-solving group higher than the contrived-problem-solving group (Ellis and Glenn, 1977).

The final investigation of subject area skills was based on data collected in 1976 from fifty teachers in thirty-two communities. These teachers recorded which skills were learned in each real-problem-solving session. When grouped into categories, the results were as follows: 67.1 percent of the sessions employed mathematics skills; 65.9 percent employed language arts skills; 62.3 percent employed social science skills; and 48 percent employed science skills. Correlations were made between sessions offering exercise in subject area skills and the inquiry processes being used. Ten problem-solving processes were divided into three categories:

1. Discussion
   a. Identifying and defining the problem
   b. Deciding on information and investigations needed
   c. Determining what needs to be done first
   d. Deciding on the best way to obtain the information needed
2. Investigation
   a. Carrying out the data collection procedures
   b. Detecting flaws in the data-gathering process or errors in the data
   c. Organizing, analyzing, and interpreting the data
   d. Suggesting possible solutions based on the data collected
   e. Trying out various solutions and evaluating the results
3. Implementation
   a. Working to implement the solution decided on by the class

In this study two issues were investigated:

1. *How much* is the probability of instruction in each of the four skill categories increased or decreased in the presence of each of the ten problem-solving processes?
2. What is the probability ... that this increase or decrease shows up ... as a result of chance alone? (Education Development Center, 1978a, p. 32)

It was found that instruction in each of the subject area skills was more likely (an increase) in sessions focused on some problem-solving processes and less likely (a decrease) in sessions focused on other problem-solving processes. For each of the ten problem-solving processes, however, there was a net gain in basic skills instruction. "One of the most striking features is the strong effect ... which investigative processes seem to have on mathematical instruction" (Education Development Center, 1978a, p. 34).

Problem-solving processes. A unique approach to examining problem-solving-process ability is the situational test developed by Dr. Bernard Shapiro of Boston University. A small but real problem involving choice of variables, observation, and decision making is given to one or more subjects at a time. The subjects are observed while they are dealing with the problem. Then they are asked some structured questions. Because each test administration can take no more than one-half hour, subjects' persistence and refinement of procedures are not measured. In the first situational test, the *Notebook Problem*, a student is given three notebooks with differing numbers and sizes of pages, quality of paper, color, and price and is asked to recommend the best for quantity purchase by the school. Pens, pencils, erasers, and a ruler are available to the student, and the price is stamped on each notebook. The process variables tested are whether the student used (1) measurable or nonmeasurable reasons for selection or (2) opinion, suggested tests, or actual tests. The test was administered separately by Boston University staff in 1971-72 (Shapiro, 1974) and by University of Minnesota staff in 1976 (Ellis and Glenn, 1977). The Boston University test sample consisted of students in fifty-three classes from grades two through six in seven school districts, which were chosen for variety in socioeconomic conditions and geographic locations. The University of Minnesota sample was limited to one school district.

Both groups found that the number of objectively measurable reasons given for selecting a particular notebook increased significantly after students had had experience working on real problems. The Boston University report concludes, "it would appear that in terms of the two independent variables studied, the [real-problem solving] experience had, irrespective of problems or teachers involved, a marked and positive effect on students' problem-solving behavior" (Shapiro, 1974, p. 13).

. . . the ideal role for real-problem solving in the school is a combination of two emphases: real-problem solving can be used for both development of the ability to apply quantitative skills and development of student responsibility and initiative.

The *Pencil Problem*, a variant of the Notebook Problem, was administered by the USMES Curriculum project staff in 1976-77. The problem involved having students recommend to a principal which of six national brands of pencils should be purchased. Four schools of different size, geographic location, and racial/ethnic composition were chosen for extensive study. Because of time and budget constraints, the Pencil Problem was administered only once, near the end of the school year. The test was given to groups of three students each, randomly picked from classes in the same school according to whether the students had engaged in real-problem solving. On three outcomes (number of factors considered, number of investigations carried out, and reason used to convince others) students who had worked on real problems did better than those with no experience (Education Development Center, 1978b).

Two other types of evidence collected by Boston University staff bear on problem-solving process attainment. When an instrument to measure types of student-teacher and student-student interaction was administered, the results showed that in real-problem-solving classes students suggested many more ideas and changed the subject or made random comments many fewer times than in control classes. The second kind of evidence resulted from analyses of classroom activities; results showed more small-group work and group changes in real-problem-solving classes than in control classes (Shapiro, 1972).

Student attitude. The evaluation of student attitude offers evidence of the motivational aspect of real-problem solving. This was investigated three times: in 1972-73 with 900 students in Lansing, Michigan; in 1974-75 with 85 students in Edina, Minnesota; and in 1976-77 with 600 students in four schools in different geographic and socioeconomic situations. The results are significant in their similarity. A large majority of students (92% to 98%) thought that real-problem solving was fun, few (4% to 12.5%) found it boring, about half (45% to 53%) thought that real-problem solving was hard work.

In another part of the 1976-77 study, a longer questionnaire was administered to students in both real-problem solving and control classes. The questionnaire focused on attitudes toward (1) working on real problems and producing effective solutions, (2) group interaction, and (3) specific problem-solving activities. In all three categories students with over twenty real-problem-solving class sessions were more positive in their attitudes than other students (Education Development Center, 1978b).

Real-Problem Solving and the School Program

Much of the focus of the two 1976-77 studies was on four schools in different parts of the nation (Education Development Center, 1978a, 1978b). This in-depth examination revealed that the intelligent and enthusiastic support of the school principal is the most important requirement for the implementation of real-problem-solving work in a school. In addition, because the studies included the administration of a problem-solving instrument (the Pencil Problem), an evaluation of student attitudes, and a correlation of the skills learned with the problem-solving processes taking place, there is evidence that the role given to real-problem solving in the school curriculum affects the type of learning achieved.

In one large city school which used real-problem solving to complement a strong and highly structured basic skills program, students scored higher than average on quantitative problem-solving outcomes but lower than average on attitude outcomes. In contrast, in another large city school, which focused real-problem-solving work on the development of student responsibility and sense of school ownership, students scored higher than average on attitude outcomes and lower than average on quantitative problem-solving outcomes.

From these studies, it can be seen that the ideal role for real-problem solving in the school curriculum is a combination of two emphases: real-problem solving can be used for both development of the ability to apply quantitative skills and development of student responsibility and initiative.

Because real-problem solving is interdisciplinary, some adjustments in the time devoted to the traditional subject areas may be necessary in order to make real-problem solving an integral part of the school day. As much as one fourth to one third of the time normally spent on mathematics, language arts, science, and social science can be safely assigned to real-problem-solving activities, because of the large amount of both subject area skill and inquiry skill learning that takes place during these activities. In some schools this re-allotment of time has been successfully accomplished through team teaching. In other schools teachers in self-contained classrooms rearrange the normal schedule by themselves. Other teachers use back-to-back scheduling of classes to allow them to operate as a team for teaching real-problem-solving activities.

In a survey of 160 teachers who had real-problem solving as an instructional strategy, 54 percent of the teachers felt that real-problem solving was a useful support for the mathematics program, 57 percent felt that it provided useful support for the social science program, 74 percent felt that it enhanced the science program, and 43 percent found it useful in the language arts program. The survey also showed that 68 percent of the teachers used real-problem solving as part of more than one subject, and 56 percent used it for more than two subjects.

For real-problem solving to have an optimal value in the school program, content scheduling in the various subject areas should be done with reason and forethought. Because all activities in real-problem solving are initiated by students in response to the problem, it is difficult to state unequivocally what activities will take place and what skills will be learned. However, lists are available of activities that have been used to solve many specific problems (Shapiro, 1972).

Initiating Real-Problem Solving

Real-problem solving requires different teaching strategies from those used for many traditional learning modes. The teacher acts as a coordinator rather than an activities director. This requires flexibility, good questioning techniques to encourage good problem-solving processes, and the ability to work with several small groups of students, each of which may be working on a different aspect of a problem. These strategies come naturally to teachers whose classes have been involved in student-directed projects. All that is needed is an overview of the basic philosophy of real-problem solving, discussion of real-problem-solving strategies that have worked well for other teachers, and a review of the available resources. Other teachers can obtain firsthand experience with real-problem solving through inservice workshops provided by education departments in many universities. Whether teachers attend inservice workshops or not, it is important that they meet regularly to discuss difficulties they are having and to share their successes.

Conclusion

Learning in real-life contexts — real-problem solving — offers students the opportunity to develop inquiry skills while learning and applying mathematics and language arts skills. The first real-problem-solving project is not easy — the classwork is not as structured as most other work, and specific skills are not taught according to a time schedule. But the results are well worth the effort and, with the support of the school principal and the community, much can be accomplished.

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What's Basic? A Constructivist View

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Editors' Note: *Much research on child development has implications for how children learn and how they can be helped to learn. Thomas O'Brien draws upon that research, including the work of Piaget, to highlight factors to be considered in basic skills instruction. O'Brien emphasizes that individuals each have their own personal construction which determines what they see and learn and that learning involves revising of those constructions (or constructs). O'Brien also emphasizes the distinction between the learning of isolated facts and the learning of general principles. He suggests that active participation in problem solving is the most effective way to help children revise their constructs. This concept of constructing personal structures of the world is consistent with the discussion of schema theory in the Tierney and Pearson paper but draws upon a different research tradition.*

Did you see the film *Casablanca*? Or *The Deerhunter*? Did you see them with a friend? My wife and I almost always come away from a film with different reactions. "It was about war," she said of *The Deerhunter*. "It was about human nature," I said. "It was about friendship," she said. "It was historically inaccurate," I said. To this day our impressions of this film differ, albeit with some points of agreement.

We do agree, however, about *Casablanca*. We saw the film for the third time recently. As usual, we agree that we saw very different films. Moreover, we agree that each of us saw a very different *Casablanca* from the *Casablanca* we remembered.

Issues to Consider in Thinking about Basics

Constructions

People do not merely store what they experience. We are not cameras or photocopy machines. What we *all* do is interact with the world. We screen reality. We act on it. We interpret it. We modify and re-form it according to the networks of ideas we have already formed.

But the things of the world act on us, too. When we see *Casablanca*, for example, the old networks of ideas about government, about Humphrey Bogart, about war, change to incorporate the new information we engage. So it is with all our dealings with the world.

Such a view — a constructivist view — sees people as active, not passive, in dealing with reality. It sees knowledge as a construction, not an accumulation. It sees people not as controlled by stimuli but as controllers of the stimuli, in the sense that they select and interpret and re-form the stimuli. It sees ideas as complex networks growing and alive, not as straight lines. It sees people's main intellectual activity as organizing, and it sees the organizing, from the newborn's touching and seeing and sucking actions to the physicist's elaborate equation making, as tending toward coherence, stability, economy, and generalizability. Finally, it sees the human mind as not satisfied when it has achieved coherence but as actively searching for and creating novelty to engage, dissonance to conquer, risk to take. The mind is an organism, not a mechanism.

It's as though we should all, children especially, be seen as wearing sandwich boards saying "Under Construction," or even better, "Under Construction — Self-Employed." But that is not at all to say that parents and schools have no role to play. They provide the raw material — experience — from which the constructions are built. And they must match the building materials to the builder.

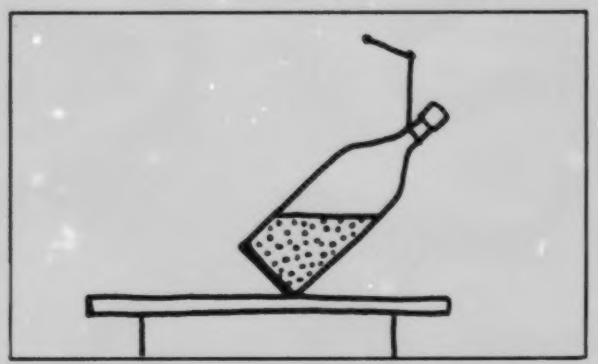
Developmental Aspects

When I was five years old, I made a tie rack for my father. The tie rack I would construct now would be very different. Similarly, the mental constructions one makes from age to age are very different. They are different in amount, of course — experience accumulates with age. But they are also different in kind, and it is *this* difference that has interested researchers over the past sixty years.

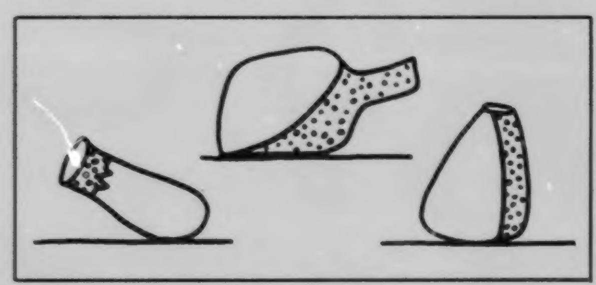
The research is far too lengthy and detailed to report here; one can only hint at its richness. The research ranges from the actions and coordinations of the newborn to the growth of language and organizing principles (number, time, causality, etc.) in young and school-aged children to the logical abilities of older adolescents. It generally concerns the questions, "What do people make of the world?" How do they organize the things of the world that they experience? How do they organize the things that they know already? And how does this organizing develop? Instead of asking about the effect of the stimulus on the organism (the usual question), the research asks about the effect of the organism on the stimulus.

The method of research is often surprisingly simple. Much of the research involves careful observation of individuals as they solve problems. How does the infant reach for a rubber duck placed near his right hand when he already holds a rubber frog in his right hand and his left hand is free? He drops the frog and reaches for the duck with the right hand. Until about 6 months of age, infants rarely reach across the midline (Bruner, 1973, pp. 254-258). How does the child formulate the rules for a game of marbles? How does the seven year old infer how many candies are hidden if she saw ten originally, some were taken, and she now sees three? How do four year olds, seven year olds, and twelve year olds answer the question, "Why do clouds move?" How do the ten year old and the eighteen year old define "propaganda"?

The results are often striking. In one project (Inhelder, 1969) children aged five to six years were shown either a drawing of a bottle or an actual bottle partly filled with colored fluid.



An hour later, a week later, and six months later, they were asked to draw what they had seen. Commonly, children drew situations that they had not seen and could never have seen, because they could not exist in the real world.



Such findings (and they are abundant) make it clear that the mind is not a camera, that the mind selects, interprets, and reconstructs what comes to it in terms of its existing mental networks. Moreover, the findings show developmental change. In the research cited, 30 percent of children progressed at six months (without a new look at the bottle), 53 percent remained the same, and, in general, correct drawings after one week remained correct after six months.

Flow of Events

The research — sixty years worth in various cultures on a wide range of issues with the same general results — suggests that a construction is at once the coordination and elaboration of previous constructions and the springboard to future constructions. Some of the main events in the development of thinking are described below.

From roughly birth to twenty-four months, the child constructs and coordinates actions (looking, reaching, grasping, looking and reaching, etc.) that progress from being ends in themselves to being means to ends of purposeful behavior; begins symbolic and representational thought and action (imitation of people or objects no longer present, symbolic play, drawing, and language); and constructs one of the milestones of intellectual growth, the notion of object permanence. This notion that an object exists independent of a person's observations or activities is one of the fundamental supports of rational life. (Imagine what life would be like if objects were thought to lose their existence when we ceased contact with them.)

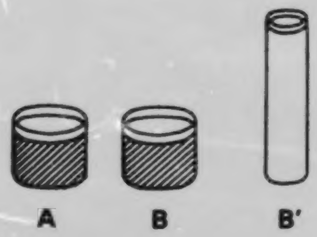
Just as the two year old is different from, not merely more than, the newborn, so is the six or seven year old qualitatively and quantitatively different from the two year old. From two to six years, the child constructs a wide variety of abilities, the most extraordinary of which is the acquisition, elaboration, and coordination of language and communication skills that enable him or her to interact more fully with the world. What an incredibly complex job this is!

But the child still has a long way to go. During the school years still new advances of fundamental importance take place. One of childhood's dominant characteristics is egocentrism, the view that one's concepts, percepts, and points of view are the only ones possible and thus are shared by the whole world. (Egocentrism is dominant in, but by no means confined to, childhood.) The following examples, both from research and from everyday life, should be familiar:

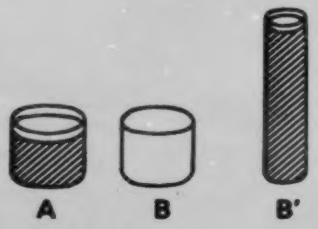
> *While driving to a picnic we get lost. The six year old points to the car in front of us. "Follow him," he says. "He's going to the picnic." "Why?" "Because we are."*
>
> *Two children scrapping in the schoolyard are called by the teacher. Each tells her story. Each sees no sense at all in the other's story.*
>
> *"Jane, do you have any sisters?" "Yes, Sue." "Does Sue have any sisters?" "No." Or, "Do you have any enemies?" "Yes." "Are you an enemy?" "No."*
>
> *Second-grader John writes "John" at the top of all written school assignments, despite the fact that there are four children named John in the class. He knows who he is.*
>
> *Egocentric monologue is "conversation" with no listener, no give-and-take, no communication.*
>
> *Egocentric dialogue is "conversation" with a listener but with referents clear only to the speaker. You telephone your friend and the friend's child answers. "Who is this?" you ask. "It's me." The child knows who he is, so obviously you must know, too.*

It seems that young children are unable to consider a point of view other than their own. Later, they are able to admit an alternate point of view but are unable to coordinate it with their own. As they meet and engage various points of view, especially those moderately different from their own, children develop this coordination.

Coordination plays a dominant role in other affairs as well. It is not only concerned with one's view *vs.* others' views. A series of classic experiments shows this. Fill two jars with colored water as shown:



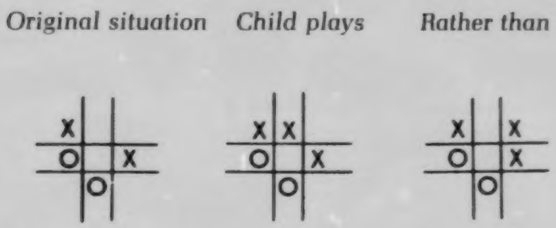
Then pour B into B' as shown and ask which jar has more.



As with the earlier construction of object invariance, over the elementary school years the child constructs the notion of the invariance of *properties* (in this case, volume) of objects. Younger children commonly say that B' has more, although they freely admit that when B' is poured back into B the volumes are the same. They tend to be dominated by how things look, to center on one dimension (here height) rather than to coordinate dimensions, and to have no sense of reversibility.

The following less formal observations of school-aged children are familiar to parents and teachers:

> *Hold up five fingers. Child counts, "One, two, three, four, five." Hold up the same five fingers and one finger of the other hand, and the child starts over again, "One, two, . . ." Five is one issue, six is another.*
>
> *Young children are often not willing to admit that a person can live in Chicago and in Illinois or that a person can be a doctor and a mother.*
>
> *Playing tic-tac-toe, young children are often incapable of coordinating offense and defense. Further, children are often unable to attend to two alternatives simultaneously. X will often play as shown, ignoring the chance for a double kill.*



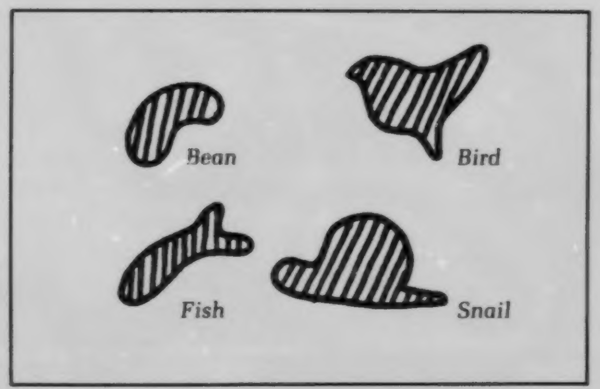
> *Play "I Am Thinking of a Person," a version of Twenty Questions. At first, children's questions are likely to be unrelated to one another or inconsistent with available information. In time, children move from atomistic questions ("Is it Miss Jones?" "Is it Helen Smith?") to questions involving classification ("It is a male?") and which are consistent with previous information.*
>
> *Play "I Am Thinking of a Number." The number is between 1 and 100, and children are allowed only questions such as "Is it greater than . . . ?" or "Is it less than . . . ?" Children will gradually construct transitivity; if the mystery number is known to be greater than 50, "Is it greater than 40?" is a wasted question.*

The period of elementary school coincides with the child's construction of thought operations in which concept triumphs over percept, in which children decenter from their own point of view, and in which coordination of variables and the reversibility of arguments become established.

With adolescence begins the period of the *possible*. The child becomes increasingly able to deal with all the possible variables and combinations of variables in a given situation ("Here are five differently colored liquids. Two or more of the liquids can be combined. One combination of the liquids will be colorless. What combination?"). The child is also able to construct the scientist's all-things-but-one-being-equal argument and can transcend the immediate here-and-now by creating objects that cannot possibly exist. (In assessing the effects of variables influencing a pendulum — bob weight, string length, angle of arc, etc. — the adolescent can effectively create a zero-length pendulum string by running successive trials with different weights but with string length kept constant.)

Thinking does not stop developing in adolescence. Some researchers are at work on even higher levels of development. However, many adolescents are firmly rooted in concrete experience or are only at a beginning stage of the period just described. The "Four Island Problem," adapted here, was fully solved by only fourteen percent of high-school students (Karplus, 1970).

> *Pretend that you are going to take a vacation trip to some islands that are new to you. You are particularly interested in four islands: Bean Island, Bird Island, Fish Island, and Snail Island.*



You have to determine whether you can travel between these islands by plane. You ask a travel agent first whether it is possible to travel by plane between Bean and Bird Islands. The travel agent says that (1) people can go by plane between Bean and Fish Islands, but he is not sure whether this is a direct route or a route with stopovers, and (2) people cannot go by plane between Bird and Snail Islands.

From this information you must determine whether you can fly between Bean and Bird Islands. The possible answers are "Yes, for sure," "No, for sure," and "I can't tell from the two clues."

You next ask the travel agent whether you can go by plane between Fish and Bird Islands. He gives you the two clues again and now adds that he can say for sure that people can go by plane between Bean and Bird Islands; again, he does not know whether this is a direct route or a route with stopovers. From this information, figure out if you can go between Fish and Bird Islands. The possible answers are "Yes, for sure," "No, for sure," and "I can't tell from the three clues."

Your third and last question is whether you can go between Fish and Snail Islands. Use the information you already have to answer this question. Again, the possible answers are "Yes, for sure," "No, for sure," and "I can't tell from the three clues."

Memory and Knowledge

An increasingly common view holds that there are different kinds of memory, for example, memory in the strict sense (I remember that George Washington was born in 1732) and memory in the wide sense (I remember that a jar's capacity is not determined merely by its height). In addition, there are different types of retrieval, for example, recognition (Didn't I see you at the picnic last week?), recall (Who was the twelfth president of the United States?), and reconstruction (31 × 20 is 620, because 30 × 20 is 600 and 31 is one more than 30).

Related to these distinctions is the distinction between knowledge in the narrow sense and knowledge in the broad sense. A child can "learn" number facts, for example, by rote and can probably, in the short term at least, recall them. It is unlikely, however, that the child will be able to reconstruct the number facts if her strict memory fails. (An almost universal teacher complaint is that children return from summer vacation remembering little of what they learned in June.)

On the other hand, if the child constructs number facts in a relational way (2 + 3 is 5 because 2 + 2 is 4 and 3 is one more than 2), she can reconstruct the 2 + 3 if need be. She can use memory in the wide sense to help. Moreover, knowing that 2 + 3 is constructible suggests that (1) knowledge is something other than random facts to be stored, (2) it is something one has control over, and (3) old knowledge is capable of being combined to make new knowledge.

Factors Leading to Intellectual Growth

Knowledge in the wide sense is a person's collection of organized processes brought to bear on the environment. Four factors contribute to knowledge development: maturation, experience and activity, social transmission, and self-regulation.

Maturation is necessary for development but is clearly not sufficient by itself. Not all eleven year olds (or two year olds or forty year olds) have the same quality or quantity of thinking.

Experience is a major factor, especially experience and activity involving manipulation and interaction with objects. (One definition of thinking is "interiorized action.") When a child sorts beads, for example, he is beginning the underpinnings of classifying. When he counts blocks in various configurations, he learns that the number of blocks is independent of a particular configuration. (Why is so much of school work limited to paper-and-pencil tasks?)

Social transmission is important, especially as it involves give-and-take and genuine exchange of ideas, information, and viewpoints. In engaging points of view different from her own, the child alters her mental networks to incorporate the input.

Self-regulation, where the child (or the adult) engages a new situation, assimilates it, and accommodates his mental networks to it, is most central to learning. Intellectual development is a form of adaptation, and learning in the wide sense is provoked adaptation. The match-up (better, moderate mismatch) between the new situation and a person's present mental networks is critically important, as is the context in which the new situation occurs (Wason et al., 1972). This is where teachers and parents play their role, lest children be left to the random events of everyday life.

What Is Basic?

What, then, is basic in a child's school education? Perhaps it is helpful to distinguish between knowledge in the narrow sense and knowledge in the wide sense and to realize that the two can be mutually supportive. (They can also be mutually indifferent, even destructive.)

There are dangers at both extremes. Knowledge in the narrow sense can amount to lists of trivial or atomistic facts or to a surface layer of "right words" with few, if any, underpinnings. And the notion of knowledge in the wide sense can be so airy that it has no substance, gives no direction to educators, amounts to vague though well-intentioned generality.

I strongly recommend a wide view of what is basic. We should see self-regulation as basic. That is, children should be prepared to deal with the problems that arise in their world, even though much of their future world is unknown to us at present. Further, they should be self-sustaining. They should, in general, develop an internal roadmap of the world that is coherent and stable and useful and open to new growth.

I strongly recommend a wide view of what is basic. We should see self-regulation as basic. That is, children should be prepared to deal with the problems that arise in their world, even though much of their future world is unknown to us at present. Further, they should be self-sustaining. They should not wait for nutriment to come to them but should be able to find their own. They should, in general, develop an internal roadmap of the world that is coherent and stable and useful and open to new growth.

Perhaps the most ambitious attempt at redefining basics in the history of American education was the curricular revolution of the 1960s. The chief characteristic of the "new curricula" was an emphasis on the structure of the various content areas. This approach has been discarded for a variety of reasons (for example, teachers were rarely encouraged to engage the structure to make it their own, there was a wide gap between the adult content specialist's idea of a discipline's structure and the interests and mental networks of young children, and the "new curricula" reached children largely as knowledge in the narrow sense). But structure should not be discarded, lest we have mere bits and tricks.

Robert B. Davis, in a 1967 introduction to the Madison Project, states a position in math education that captures the best of what the "new curricula" tried to do.

> If we devote grade 1 to addition facts up to 10, grade 2 to addition facts up to 100, and so on, we are putting one foot in front of the other, left, right, left, right ... This approach is weak in power.
>
> If, instead, we seek those basic mathematical concepts, techniques, and attitudes which play important structural roles in the development of the subject, we have a far more powerful approach. Cartesian coordinates, introduced (say) at grade 2, give us an ability to relate any arithmetic or algebraic problem to a geometric one, and vice versa. For all the rest of our lives we shall be able to unify algebra and geometry into a single coherent subject. This is *power*.
>
> Once we learn such basic structural concepts as variable, function, mapping, and so on, we have a strong structural framework to which *all* of our subsequent mathematical learning can be related. This, again is power! Here we are building cognitive structures that can well serve as foundations for improved structures in the future. (p. 9)

A constructivist is likely to be more concerned with the child's construction of thinking abilities than with the discovery of the structure of content (or with the passive storage of structure). Perhaps Davis's statement should be revised as follows:

> *If instead, we seek those basic operations, techniques, and attitudes that play important structural roles in the child's intellectual growth, we have a far more powerful approach. For the rest of his or her life, the child will be able to continue to build a coherent roadmap of reality, one that enables the child to construct and test relationships, to infer, and to withstand the seductive domi-*

nance of percept over concept (or propaganda over fact). This is power. Once the child learns such basic operations as classifying, ordering, logically multiplying, inferring, and so on, he or she has a strong structural framework from which subsequent knowing can evolve. This, again, is power! Here we are building cognitive structures that can serve as wellsprings of improved and more complex structures in the future.

In general, I suggest, the goal of education should be to cause intellectual growth, not merely to teach children the facts, rules, procedures, conventions, and nomenclature of narrow knowledge.

What are the components of this intellectual growth? They include those operations listed above and, more generally, an ability to organize, to coordinate, to pull into coherence the disparate entities of environment, experience, and inference, and to regulate between one's internal networks and the demands of external reality. In classrooms this would call for children to be involved in issues that generate an ability to discern relevant from irrelevant; to distinguish between necessary and plausible and merely possible; to generate, to exhaust, to test, and to cancel alternatives; to know, given a situation, the necessary conditions and the sufficient conditions and the difference between necessary and sufficient; to solve problems and to generate new ones; and to inquire and to become self-sustaining in that inquiry.

To call for such an approach is to say that static knowledge — pat answers — will not suffice for children who will spend the greater part of their lives in the twenty-first century, and whose children will be alive in the twenty-second century!

A constructivist approach is by no means at odds with traditional content areas, though it is at odds with the view that knowledge is static. The approach is widely, though unofficially (and often surreptitiously), espoused by American teachers, and it goes to the heart of what it is that really is basic in the education of children. Brearley captures this concept in the following words:

> The main work of the school is surely the fostering and developing of mental life, enabling children to experience more fully and consciously all that life has to offer. This large, overall aim is to be achieved by an infinity of steps small. The material we provide children can seldom be thought of as an end in itself but rather as a means through which effective thinking and feeling are fostered. (1969, p. 7)

See the classroom activities following the list of references.

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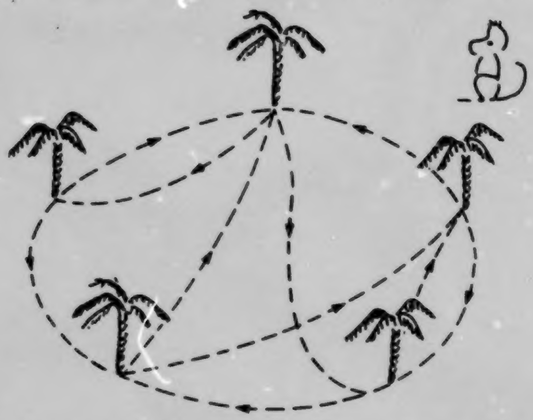
Classroom Activities

Below are some locally developed classroom activities that show a constructivist point of view in action in that they call for the construction and testing of relations and alternatives. Do not merely read them. Do them, preferably with group discussion; then extend them or adapt them to local situations.

1. A monkey went from tree to tree as shown. Where did he start? Where did he finish? (Problems of this sort can lead to serious mathematical study. No less, they get children involved with trial and error as a problem-solving tactic, with alternative searching, and with the beginnings of a concept of proof.)



(By Dr. Jerzy Cwirko-Godycki, Warsaw, who used this problem at the Eighth Annual Teachers' Center Residential Course, August 1979.)

2. Can you change a bird into a horse? (You can change a cat into a dog by going cat→cot→cog→dog.) In changing a bird into a horse you can change or add one letter at a time. All the words you use must be real words. The dictionary is the referee. Here are some others to try:

cat→mouse	dad→father
love→despise	mom→mother

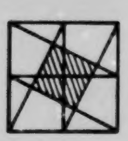
(By Teachers' Center participants from East St. Louis, Illinois. Included in SEEDBED, vol. 1, no. 2, available at cost, $1.00, from the Teachers' Center Project.)

3. Here are some headings for lists:
   Things that fly
   Things used in cooking
   Things found in a kitchen
   Things associated with Christmas
   Things that are often hot
   Things used for transportation

   Make up some headings like this. Then pair the children in your class. Give one heading to one of the children in each pair. His or her task is to name things that belong on the list (without using any word given in the heading). The second child's task is to guess what the heading is. Then children exchange roles with a new heading.

(By Teachers' Center participants from East St. Louis, Illinois. Included in SEEDBED, vol. 1, no. 2.)

4. Here is a figure drawn on inch-square graph paper. What is the area of the shaded square?



(By David S. Fielker, London, who used this problem at the Seventh Annual Teachers' Center Residential Course, August 1978.)

5. One child builds a building from blocks, one block at a time. The building is hidden from a second child. The first child gives a verbal description of his or her actions, and the second child's task is to construct an identical building. (The descriptions can also be given in writing.)

(From Elizabeth Thomas, East St. Louis, Illinois. Included in SEEDBED, vol. 1, no. 2.)

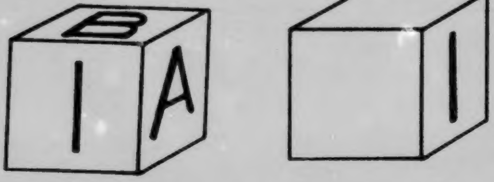
6. "There are lots of hice on my street." Strange sentence, isn't it? The plural of mouse is mice but the plural of house is not hice. Write some strange sentences of your own. Try them out on classmates and see if the children can figure them out.

(From T.C. O'Brien, Solve It, *Chicago: Daigger/ETA, 1977.)*

7. Pretend that you have just moved into your neighborhood and want to be prepared for emergencies. What phone numbers would be useful to have? Get together with some friends and make up an emergency telephone directory.

(From T.C. O'Brien, Solve It, *Chicago: Daigger/ETA, 1977.)*

8. The right cube is the same as the left cube, but the artist was in a hurry and didn't finish his work. Finish it for him.



(From T.C. O'Brien, Solve It, *Chicago: Daigger/ETA, 1977.)*

9. "When children do write, they often feel that they're writing only for the teacher's approval or disapproval. 'The teacher doesn't read it. She only marks it,' said a second-grade Canadian child who had just written a beautiful story about a bird building a nest. Thus, children learn quickly that writing is a distasteful chore, not a chance to communicate ideas.

"The main job of a teacher concerned with children's writing is to invite 'the expressive mode.' It is important to create trust between writer and reader, something that is often accomplished when a child knows that what is written will be read, respected, and responded to. Children should be encouraged to take risks in their writing, not just produce 'Dick and Jane' sort of pap.

"Children's writing was successfully encouraged in Toronto schools by setting up a mailbox system, whereby children write notes to one another (and to the teacher) in some twenty-minute period during the day. The mail, addressed, is placed in a class mailbox and delivered, without the teacher's inspection, at the end of the day. A situation like this will draw out the most reserved of children.

"Teachers are under constant pressure to make children conform to adult grammar rather than to encourage fluency of oral and written language. Correctness of grammar is important, but it should follow, not precede, fluency. Emphasis on grammar can stifle fluency completely.

"One way of encouraging correctness of grammar, as well as introducing new vocabulary and bringing about good writing habits (the fluent use of descriptors, etc.) is for teachers to read quality books to children at least half an hour each day. This is a must for Toronto teachers who work with me.

"Children can enrich themselves and one another by writing books for the school library. Artistically talented children can illustrate the books. The books, bound safely in hard cover, go into the library with a card catalog entry. To make the child-author know he's succeeded, as well as to get the books more widely known, children's books are farmed out occasionally to teachers in the school — not the child's own teacher — whose job it is to read the book and write a short note saying something like, 'I read your hockey book, John, and I like it very much.' John will carry that note with him throughout the school year and the teacher will tell other children about John's book."

(From John H. Bates, Toronto, included in SEEDBED, vol. 1, no. 1.)

10. Here are two multiplication grids. Complete them.

Left
x top

Left x top	3	5
4	○	20
7	21	○

Left
x top

Left x top	7	○
○	○	16
4	○	32

(From T.C. O'Brien, Puzzle Tables, *Cuisenaire Company of America, Inc., 1980.)*

Issues in Basic Skills Outcomes and Classroom Planning and Assessment

Overview: *Papers in this section provide background to help schools and school districts determine what skills students are to learn and how they are to be assessed. The first three papers — by Robert Stump and Nina Selz, Georgine Loacker and Marcia Mentkowski, and Lena Lupica — explore from different perspectives the skills needed for success in work and adult life, now and in the future. In the fourth paper, Vito Perrone and Walter Haney describe different approaches to assessing student progress and analyze some of the strengths and weaknesses of those approaches. Pat Weiler's paper deals more broadly with planning and assessment of instruction in the classroom.*

Basic Skills for the World of Work

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Nina Selz
National Center for Research in Vocational Education

Editors' Note: *In this paper Robert Stump and Nina Selz summarize results of several studies designed to identify important skills, knowledge, and attitudes needed in the world of work. The information is presented here as background for persons planning basic skills programs which, among other things, might be expected to prepare persons for the world of work. The data suggest what skills are needed and how home, school, and work must cooperate in teaching or reinforcing the skills.*

Teachers, parents, students, principals, school boards, and everyone vitally concerned with maintaining and improving the high quality of our nation's schools face a tremendous challenge in responding to recent federal legislation calling for basic skills improvement. As the various papers in this handbook demonstrate, there is no clear-cut path to success. But we *can* identify a reasonable starting point — basic skills improvement must begin with the fundamental question, "What *are* the basic skills?" We will address this question in terms of the basic skills needed for the world of work.

Traditionally, high school curricula range from vocational training for a specific job to college preparatory courses for a liberal arts education. In between are general curricula and pre-professional education. At the one extreme, specific skills training in vocational education is seen as too narrow and not sufficient preparation for the forty years of work that students can expect to face after leaving high school. At the other extreme, liberal arts graduates are sometimes viewed as well educated but incapable of doing anything practical in the work world.

This paper will report on a project funded by the National Institute of Education at the National Center for Research in Vocational Education. The project's starting point was the question, "What are the basic skills for the world of work?" The answers we found are described here with implications for improving basic skills instruction.

What Are the Basic Skills?

A very common phenomenon in the world of work is that people change jobs. Studies by the U.S. Bureau of the Census over the last ten years have reported that at least nine to eleven million people change occupations within a twelve-month period (Byrne, 1976).

We reasoned that if people are going to change occupations throughout their lives (and there is ample data to suggest that they do even up to age 50-59), schools should be equipping students with the skills and abilities that are useful across a wide variety of occupations. These are called *transferable skills* or *occupational adaptability skills*. Our initial task was to identify these skills and abilities. We approached the task in several ways.

Our first step was to talk with employers and working adults in a series of meetings across the country. We began each meeting by asking participants to answer three questions:

1. Since you started working full-time, how many different jobs have you held?
2. Considering all the different jobs you have held, which were the two most dissimilar?
3. In spite of the dissimilarity, were any of your skills and abilities useful in both jobs? Which ones?

The number of different jobs held ranged from two jobs to one hundred and included a full range of blue-collar and white-collar jobs. Employers and working adults easily identified a great number of skills and abilities useful in very different jobs. A summary of these responses is given in Table 1. In addition, although the question asked respondents to identify skills and abilities, the responses were quite diverse and included all elements of performance in the world of work (knowledge, skills, and attitudes). The frequent mention of attitudes not only confirmed a prevalent notion that one's attitudes are basic to success in the world of work, but it also suggested that when terms like *lack of skills* or *unskilled workers* are used to describe recent school graduates, they might mean more than the surface meaning implied by the terms. Although knowledge was sometimes mentioned by itself as a factor, the concern was almost uniformly with the capacity to perform — *skills* and *abilities* — and with attitudes associated with performance. No distinctions were made in the importance of the three categories of transferable skills listed in Table 1, all three being considered essential for success in the world of work.

As shown in Figure 1, adequate performance in the world of work can be pictured as a triangle. Each side represents one of the three components of performance, each of which is potentially transferable. The triangle illustrates the interdependence of the three — if any one of the sides of the triangle is removed, the other two will collapse.

Our second approach to the task of identifying the basic skills needed for work was to look at previous research on skills and abilities common to many jobs (Sjogren, 1977; Pratzner, 1978; McKinlay, 1976). These studies differed in the level of detail and the range of occupations or jobs that they examined. The results can be summarized by looking at one study conducted in Canada (Smith, n.d.). The study was based on a survey of representative skilled and semiskilled jobs (blue collar and clerical) throughout the economy. Workers and supervisors were asked to identify job performance requirements. The skills categories included mathematics, communication (written and oral), interpersonal, and reasoning. Table 2 summarizes the skills in each of the categories that are common to the jobs. Table 3 does the same for the tasks that are common for supervisors of these jobs.

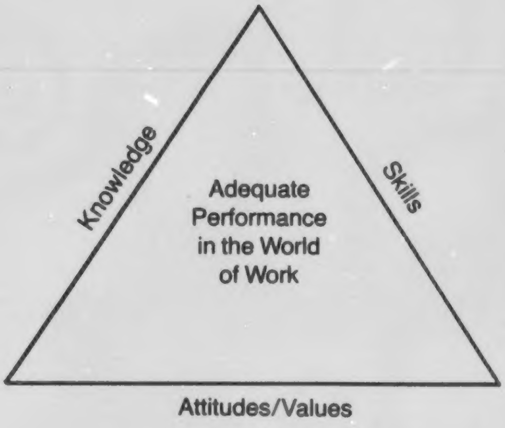

Figure 1. Requirements for adequate performance in the world of work

Looking at these lists, it is easy to see things that are included in most school curricula, for example, multiply and divide; know plurals, prefixes, and suffixes; and read notes, letters, and memos. Students are often tested on their performance in these areas. In addition, however, these jobs have in common many performances that are part of the school experience but may not receive explicit attention in the curriculum or testing in school, such as give directions and information, participate in group discussion, read forms, establish task priorities, and determine relevant information for problem solving.

Table 1

Composite List of Transferable Skills Identified by Conference Participants*

Intellectual/Aptitudinal	Interpersonal	Attitudinal
Communicating (44)	Working with, getting along with, or relating to others (28)	Diligence, or a positive attitude toward the value of work (11)
Problem solving (17)	Managing, directing, or supervising (13)	Receptivity/flexibility/adaptability
Analyzing/assessing (15)	Empathizing, or being sensitive to others	Determination/perseverence
Planning/layout (14)	Teaching, training, or instructing	Acceptance/appreciation/concern for others
Decision making (13)	Counseling	Responsibility
Creativity/imagination/innovation	Motivating	Willingness to learn
Problem identification/definition	Gaining acceptance, or building rapport	Ambition/motivation
Managing one's own time	Helping or cooperating	Self-confidence
Basic computation	Cultivating cooperation	Self-discipline
Logical thinking	Selling	Pride
Evaluating	Accepting supervision	Enthusiasm
Ability to relate common knowledge or transfer experiences	Delegating	Patience
Coping with the labor market and job movement	Instilling confidence	Self-actualization
Understanding others	Team building	Assertiveness
Synthesizing		Honesty
Marshalling available resources		Loyalty
Accommodating multiple demands		Reliability
Judgment		Risk taking
Foresight		Compromising
Trouble shooting		Kindness
Job awareness		
Mechanical aptitude		
Typing		
Accounting		
Implementing		
Self-understanding, awareness, actualization		
Situational analysis		
Assessing environments/situations		
Understanding human system interactions		
Organizational savvy		
Conceptualization		
Generalization		
Goal setting		
Controlling		
Quantitative thinking		
Dealing with work situations		
Finance		
Tool usage		
Bookkeeping		
Artistic ability		
Business sense		
Tolerance of ambiguity		

*Items are listed in approximate order of frequency within each category. Most frequently mentioned items are followed by a figure in parentheses to indicate relative frequency; thus, "Communicating" was mentioned about 44 times as often as "Tolerance of ambiguity."

Source: Sjogren, D.D. *Occupationally Transferable Skills and Characteristics: Review of Literature and Research.* Columbus, Ohio: The Center for Vocational Education, March 1977, p. 7.

Table 2

Content of Core Skill Clusters of Nonsupervisory Occupations in Generic Skills Projects

Skill Areas			
Mathematics	Communications	Interpersonal	Reasoning
1. Read, write, and count whole numbers.	1. Know plurals.	1. Attend physically.	1. Obtain information about tasks, materials, and equipment.
2. Add and subtract whole numbers.	2. Know prefixes and suffixes.	2. Attend cognitively.	2. Obtain information about methods and procedures.
3. Multiply and divide whole numbers.	3. Contractions and abbreviations.	3. React to others.	3. Obtain information about sequence.
4. Solve word problems with whole numbers.	4. Use dictionary.	4. Elementary one-to-one conversation.	4. Obtain other job-related information.
5. Round off whole numbers.	5. Synonyms, antonyms, and homonyms.	5. Task-focused conversation.	5. Recall theories or principles.
6. Read and write fractions.	6. Meaning from context.	6. Express point of view.	6. Sort objects.
7. Add and subtract fractions.	7. Use books.	7. Personable conversation.	7. Estimate time.
8. Multiply and divide fractions.	8. Comprehend oral communication literally.	8. Participate in group discussion.	8. Estimate weight.
9. Solve word problems with fractions.	9. Interpret oral communication.	9. Respond to information or directions.	9. Estimate distance.
10. Compute dollars and cents.	10. Pronounce words correctly.	10. Give instructions.	10. Sequence tasks.
11. Read, write, and round off decimals.	11. Use good diction and word choice.	11. Demonstrate.	11. Establish task priorities.
12. Multiply and divide decimals.	12. Speak fluently.	12. Monitor.	12. Set goals.
13. Add and subtract decimals.	13. Organize ideas while speaking.	13. Give directions.	13. Determine activities to reach goals.
14. Solve word problems with decimals.	14. Ask the six W questions.		14. Decide about alternatives.
15. Read and write percents.	15. Give directions or information.		15. Set criteria.
16. Compute percentage.	16. Use the telephone.		16. Set priorities.
17. Determine equivalents.	17. Literal comprehension of reading.		17. Analyze situation.
18. Know order of operations.	18. Interpretive comprehension of reading.		18. Make deductions.
19. Solve word problems (mixed operations).	19. Read forms.		19. See cause-and-effect relationships.
20. Do quick calculations.	20. Read notes, letters, memos.		20. Identify possible problems.
21. Compute averages.	21. Read charts and tables.		21. Set priorities in terms of diagnosis.
22. Read graduated scales.	22. Read manuals.		22. Explore possible methods.
23. Perform operations with time.	23. Write phrases on forms.		23. Ask probing questions.
24. Operate calculator.	24. Write sentences on forms.		24. Use senses.
	25. Write sentences.		25. Determine relevant information for problem solving.
	26. Write short notes.		26. Arrive at alternative statements.
	27. Take notes.		27. Select statement.
			28. Determine alternative solutions.
			29. Select alternative.
			30. Update plans.

Source: Sjogren, D.D. *Occupationally Transferable Skills and Characteristics: Review of Literature and Research.* Columbus, Ohio: The Center for Vocational Education, March 1977, p. 15.

Table 3

Content of Core Skill Clusters of Supervisory Occupations in Generic Skills Project

Skill Areas

Mathematics

1-24. Same as nonsupervisory occupations.
25. Compute ratios.
26. Compute proportions.
27. Compute rate.
28. Compute principal.
29. Measure weight.
30. Measure distance.
31. Measure capacity.
32. Know geometric forms and figures.
33. Computation on angles.
34. Draw/sketch geometric forms and figures.
35. Compute perimeters.
36. Compute areas.
37. Compute volumes.
38. Read graphs.
39. Read scale drawings.
40. Read assembly drawings.
41. Read schematic drawings.
42. Draw graphs.
43. Measure from scale drawings.
44. Draw to scale.
45. Solve algebraic formulas.

Communications

1-27. Same as nonsupervisory occupations.
28. Evaluative comprehension in listening.
29. Evaluative comprehension in reading.
30. Write paragraphs on forms.
31. Write paragraphs.
32. Write form letters.
33. Write single paragraph letters.
34. Write internal memos.
35. Write business letters.
36. Write information reports.
37. Write recommendation reports.
38. Write technical reports.

Interpersonal

1-13. Same as nonsupervisory occupations.
14. Attend covertly or unobtrusively.
15. Persuasive conversation.
16. Prepare group discussion.
17. Present information or directions to group.
18. Lead group discussion.
19. Maintain groups.
20. Prepare oral presentation.
21. Give factual information in oral presentation.
22. Get attention and response to oral presentation.
23. Give a conceptual oral presentation.
24. Give a persuasive oral presentation.
25. Get reaction to oral presentation.
26. Establish training program.
27. Evaluate instructional communication.
28. Demonstrate to others.
29. Give praise.
30. Give discipline.
31. Prepare evaluation reports.
32. Prepare for interview.
33. Ask closed questions in interview.
34. Ask open questions in interview.
35. Deal with confrontation situation.
36. Interview customers/clients.
37. Interview job applicants.
38. Negotiate.

Reasoning

1-30. Same as nonsupervisory occupations.
31. Sort data.
32. Rate objects.
33. Rank objects.
34. Develop classifications.
35. Estimate area.
36. Estimate capacity.
37. Estimate cubic measures.
38. Estimate costs.
39. Plan and coordinate activities and sequences.
40. Outline plans.
41. Identify resources.
42. Estimate resources.
43. Determine critical activities.
44. Make a detailed plan.
45. Make resource requisitions.
46. Monitor results.
47. Determine standards of quality.
48. Determine standards of quantity.
49. Determine standards of completion.
50. Establish priorities of standards.
51. Exercise authority and responsibility.

Source: Sjogren, D.D. *Occupationally Transferable Skills and Characteristics: Review of Literature and Research.* Columbus, Ohio: The Center for Vocational Education, March 1977, p. 16.

Our examination of the available research and our conversations with employers and working adults convinced us that it is possible to identify skills, abilities, and attitudes that are common to a number of occupations. Many of the skills and abilities identified are taught in schools. However, many may not now be taught or tested through regular school curricula. A particular concern is that the kinds of attitudes needed to survive in the world of work are not emphasized in schools.

With the increasing interest in oral communication as a basic skill area, it is important to note the prominence of such skills in these data. In Table 1 items at the top of the lists of intellectual and interpersonal skills involve oral communication. In Table 2 oral communication is prominent in both the communication and interpersonal columns. Even more impressive is the predominance of oral communication skills in the long list of additional interpersonal skills needed for supervisory occupations indicated in Table 3.

Are All Skills, Abilities and Attitudes Equally Important?

Although research pointed out what skills, abilities, and attitudes are common to many jobs and can be considered basic requirements in the world of work, we suspected that all skills, abilities, and attitudes are not equally important. We were also not certain what the public considers the school's responsibility to be in teaching them.

The National Center for Research in Vocational Education conducted four national surveys to determine the opinions of several groups concerning the relative importance of many of the skills identified in the prior studies, as well as who was thought to be primarily responsible for teaching them. The four groups we surveyed were the general public (a household survey), employers, elementary and secondary school teachers, and eighteen-year-old high school seniors.

To determine skill importance, we asked, "If a person did not have this ability, how well would he or she do at work?" Respondents were encouraged to use their knowledge of the world of work rather than of a specific job. The possible answers were, "Do well at work," "Have some problem at work," and "Have a great deal of difficulty at work." If the opinion of the respondents was that someone would have a great deal of difficulty, we classified this as an important ability to be taught and learned.

The survey also asked, "Where should a person be taught this ability?" The possible responses were, "At home," "In school" (with no indication of what level of school), "On the job," or "Somewhere else" (that is, not at home, at school, or on the job).

The responses of the general public to these questions are summarized in Table 4. They are listed in order of importance, beginning with those abilities without which an individual would have a great deal of difficulty at work. The three most important abilities were found to be (1) using the reading, writing, and mathematics skills the job calls for, (2) using tools and equipment the job calls for, and (3) getting along with others.

The entire rank ordering was about the same for teachers, employers, and students, although the actual percentages differed from group to group. There were greater differences among the groups as to where specific abilities should be taught. This can be seen clearly in the partial listing of the responses of all four groups in Table 5. A full report of the results of these surveys is available from the National Center (Selz et al., 1980).

In the opinion of the general public, all the abilities in Table 4 *are important*. In no case did more than one quarter of the public think that people would do well at work if they did not have any one of these abilities. The differences were in terms of whether or not the individuals would have "some" or "a great deal" of difficulty. It should be emphasized that the highest ranked skill is "Use the reading, writing and math skills *the job calls for*." Thus, although not stated explicitly, the concern is for applied or functional skills as used in the world of work.

On all skills there was a spread of opinion about where the skills should be taught. In some cases, such as "Use of reading, writing and math" or "Dressing and acting properly," there was a clear preference for one area over the others. However, even in those instances, 20

Table 4

Responses of General Public to Occupational Adaptability Survey Questions of Importance and Responsibility

In order to get along in the world of work a person should be able to . . .	Percent reporting that if an individual were not able to do this, they would have a great deal of difficulty at work.	Percent reporting that this ability should be taught at: Home	School	On job	Elsewhere
Use the reading, writing and math skills the job calls for	54	3	82	13	0
Use tools and equipment job calls for	52	4	26	67	2
Get along with others	51	75	15	5	4
Deal with pressures to get the job done	48	33	17	41	5
Follow rules and policies	48	37	19	41	2
Have a good work attitude	45	58	17	19	3
Do parts of job one may not like to do	44	31	13	48	3
Follow job safety and health rules	43	20	13	64	1
Hold a job that matches one's interests and abilities	40	12	40	39	5
Get a job for which one has the training and background	39	6	60	24	8
Get information about what is expected of you when starting a new job	37	5	19	67	7
Work without supervision, if necessary	35	38	23	33	3
Fill out forms as required by law or employer	33	4	56	29	8
Dress and act properly	32	80	9	7	2
Deal with unexpected things that happen	32	50	12	28	6
Know what kind of work one wants to do	29	21	55	15	5
List job interests, skills and experience for an employer	29	4	55	26	11
Tell others what you are doing or what you want done	29	31	23	33	6
Know if one wants to own a business *or* work for someone	28	16	22	42	13
Interview for different job positions when necessary	28	4	47	28	16
Manage one's own time and activities	28	62	17	13	5
Know one's rights as an employee	27	5	13	71	6
Know where to look for information about jobs one has or would like to have	26	7	46	12	30
Figure out a better way to get things done	24	27	25	37	8
Know when one's own work is being done well	24	33	18	43	3

continued on next page . . .

Table 4 (Continued)

In order to get along in the world of work a person should be able to . . .	Percent reporting that if an individual were not able to do this, they would have a great deal of difficulty at work.	Percent reporting that this ability should be taught at			
		Home	School	On job	Elsewhere
Understand wages and deductions on one's paycheck or stub	24	7	39	48	4
Get support from others to change things that need changing on the job	23	13	12	60	9
Use materials and knowledge of other people to develop job interests	23	7	41	42	5
Learn new skills to get a different job or position	22	3	41	44	8
Decide how and when to leave a job for another job	22	13	10	52	17
Understand the extras or benefits offered at work	22	3	14	78	3
Ask for a raise in salary	21	8	11	69	6
Get promoted on the job	20	3	12	77	3
Use what one already knows to do a new or different job	20	8	22	53	10
Be a member of a union or professional group	19	5	11	66	9
Do things at work in a new way when one gets the chance	18	11	13	64	6
Figure out the cost of using one's own car or public transportation in getting to and from work	18	30	35	21	10
Take chances that may result in rewards	15	28	16	37	10
Persuade others to one's way of thinking	15	32	23	17	14

Table 5

Full Set of Responses of All Four Groups Surveyed on the First Seven Skills Listed in Table 4*

	Group Surveyed	Where *should* a person be taught this (most important place)?				Where do most people *actually* learn this?				If a person did not have this ability, how well would he/she do at work?		
		H	S	J	E	H	S	J	E	DW	SP	GD
Use the reading, writing and math skills the job calls for	1	3	82	13	0	3	69	24	1	6	34	54
	2	2	89	8	0	1	73	24	1	4	18	77
	3	3	87	8	2	3	78	17	2	17	22	60
	4	2	90	8	0	0	76	24	0	6	18	77
Use tools and equipment job calls for	1	4	26	67	2	4	15	77	2	7	38	52
	2	1	29	67	1	1	13	84	1	3	21	75
	3	5	25	64	6	4	19	71	5	15	27	56
	4	3	30	65	1	0	18	81	1	1	28	71
Get along with others	1	75	15	5	4	50	29	11	6	9	37	51
	2	72	23	1	2	32	51	8	7	4	23	72
	3	58	25	8	7	38	40	10	10	20	30	49
	4	79	13	8	2	42	33	21	4	2	25	73
Deal with pressures to get the job done	1	33	17	41	5	20	14	55	6	6	41	48
	2	27	27	38	4	15	28	46	9	2	33	64
	3	27	27	38	8	16	26	49	7	11	36	52
	4	39	25	32	3	15	14	65	5	0	43	55
Follow rules and policies	1	37	19	41	2	23	23	48	2	8	39	48
	2	51	30	18	1	20	45	32	2	4	33	61
	3	34	29	31	4	23	34	36	4	17	30	51
	4	59	18	22	0	25	23	50	1	5	36	58
Have a good work attitude	1	58	17	19	3	43	19	31	4	10	40	45
	2	71	21	5	2	40	31	21	6	3	30	65
	3	54	22	17	5	42	24	27	6	18	32	48
	4	80	10	7	0	53	7	33	5	2	34	62
Do parts of job one may not like to do	1	31	13	48	3	18	13	60	4	4	46	44
	2	43	23	32	2	14	24	58	3	2	39	57
	3	27	19	43	10	17	18	56	8	10	45	43
	4	50	11	36	2	21	7	69	3	2	52	46

1, General population; 2, teachers; 3, students; 4, employers. H, Home; S, in school (any level); J, on the job; E, elsewhere. DW, do well; SP, have some problems; GD, have a great deal of difficulty.

***Percent giving each response on the three questions** (percentages not adding up to 100 due to no response or rounding error) percent of those surveyed thought the skills should be taught in the other two areas.

Some persons may see the data in Tables 4 and 5 as suggesting that one or another of the three — home, school, or job — has sole responsibility for teaching a particular skill. The data do not support such a conclusion. The respondents were asked to choose only one of the three locations and could not indicate two or three locations or a shared responsibility among all three. The significant spread on almost every skill reflects the lack of agreement on the sole responsibility of any location for teaching the skills. The presence of the spread of opinion, moreover, does not support any one area being given, or taking, sole responsibility for a particular skill.

Another possible misperception is that the data in Tables 4 and 5 suggest where the skills *should* be taught. It must be remembered that the data are the result of an opinion survey, and there is no research which indicates that any one site is best. The authors believe that an effective preparation for the world of work would require those in the home, the school, and the work settings to work together.

Improving Basic Preparation for the World of Work

Teachers, administrators, employers, and parents can use the results of these studies in a variety of ways to improve the basic preparation of students for the world of work. Keep in mind that the information presented is based on research and surveys from across the nation. Since we found very few differences among geographical regions, or between rural and urban areas, there is a good chance that what is reflected here is true in your community. Nevertheless, we would encourage you to verify these results locally.

Such verification need not be elaborate or expensive. One approach would be to use the accompanying tables and available documents to stimulate discussion among teachers, parents, employers, interested community leaders, and other responsible individuals. Their reaction would be a barometer of the extent to which local needs are similar to or different from those reported here. Such discussions will also lead to a better understanding of some of the skills involved and how the school can teach or reinforce them.

If the skills, abilities, and attitudes discussed are as important to doing well in the world of work as our studies indicate, they probably have a place at every grade level and in most subjects. This would be especially true of some of the communication and reasoning skills listed in Tables 2 and 3. Teachers and students need to be aware that these skills, abilities, and attitudes can be learned and used in a variety of classes or subjects. While acquiring the knowledge of an academic subject, students are also developing these more fundamental skills. For example, organizing ideas while speaking is a skill which is both learned and used in such subjects as English, history, and science. Students also need to realize that skills learned in one context can be used in other settings.

Perhaps the most critical and least understood event in the transition from school to work is how students do — or do not — transfer what they know and can do in a school setting to what they do on the job.

Perhaps the most critical and least understood event in the transition from school to work is how students do — or do not — transfer what they know and can do in a school setting to what they do on the job. School, community, and business leaders in a discussion might focus on the similarities and differences between the use of skills in school and on the job. For example, the basic reading, writing, and mathematics skills are important in both work and school, and the public expects these to be taught and learned at school. But reading on the job may not be the same as reading in the classroom. What is read and why it is read may differ drastically between school and work.

Using mathematics on the job may also be quite different from its use in school. For instance, in school, word problems are often used to teach application of mathematics skills to practical situations. The word problem is written, and it contains all the facts the student needs, with a minimum of extraneous information. On the job, however, instructions and information are exchanged verbally, all of the pertinent information may not be given, and, in some situations, extraneous information is more abundant than the important facts (for example, dealing with an irate customer over a bill). Thus, on the job it may be as important to know what figures should be used, and where to get them, as it is to be able to do the mathematical operations once the numbers are available.

> ***. . . students should be given the opportunity to practice important job and school skills in different contexts, and they should be made aware that they are transferring skill use and performance from one task to the other. . . .***

Our suggestion, based on these and other studies, is that students be given the opportunity to practice important job and school skills in different contexts, and that they be made aware that they are transferring skill use and performance from one task to the other (Selz and Ashley, 1978; Brickell and Paul, 1978). The practice itself will help students become more proficient, and the conscious practice of applying the skills in different situations will make them better able to transfer the use of these skills to the many work and non-work situations they will face as adults.

Finally, there is the issue of shared responsibility. Our survey clearly showed that the American public thought responsibility for teaching these important world-of-work skills is shared among schools, homes, and employers. Shared responsibility requires cooperation among the responsible parties if the task — preparation of our children for the world of work — is to be done properly. The community-wide discussions mentioned earlier might be a good forum to address the issue of shared responsibility. The emphasis should not be on who is to be blamed for failure — if there is any failure — but rather on how the three parties can work together for the adequate teaching of skills for the world of work.

In summary, our studies to date suggest that preparing today's student for the world of work should focus on a known set of important and essential abilities that can be part of the school curriculum at almost every stage of elementary, middle, junior, and high school. The task requires close cooperation among school personnel, families, and employers to make sure all the abilities are attended to. If the three groups work together more closely, our students — our children — can only benefit.

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A Holistic View of Adult Abilities

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Editors' Note: *In this paper Georgine Loacker and Marcia Mentkowski describe the procedure used and the results of efforts over more than ten years by a college faculty to more carefully describe and measure the knowledge and skills they wished their students to learn. During these ten years, the college staff have searched the literature and talked to many persons with similar concerns. This paper should be particularly useful to schools that are exploring ways to coordinate instruction among the basic skills and across the entire curriculum. Although the material presented here deals with college students, it may be helpful for staff at the elementary and secondary level to see how the college staff have been able to define goals that in many cases cut across the traditional subject areas. This account also provides a case study of how significant changes can be made in instruction and assessment. The changes were made slowly, in small steps and with much interaction among the faculty.*

Educators in the eighties will confront a diversity of questions. Some of the most important of these questions are

- *Can society count on educational institutions to prepare persons competent to live in and contribute to society?*
- *What do educators intend as the result of education? What should students be able to do with their education?*
- *What are some basic abilities students must demonstrate to graduate from our schools? How are these abilities defined? What is their place in education?*
- *How can we be sure our students actually have these abilities when they graduate?*
- *How can we be sure that the abilities we select make a difference in later life?*

For ten years, the Alverno College faculty has been grappling with these questions. We have discovered that each answer we find raises a myriad of new questions for us. But these questions keep returning us to the underlying question of the meaning and significance of education for adults. In this paper we will discuss our identification of desired student abilities, how we teach and assess them, and what we are doing to find out if what and how we teach makes a difference. Finally, we will draw some implications for the teaching of abilities at elementary and secondary levels, for we believe that education from the earliest years up to and beyond college can benefit from continuity.

Identification of Competencies

A concrete milestone in the Alverno faculty's inquiry into educational goals came in 1970, when our president challenged the faculty by asking, "What are you teaching that is so important that students cannot afford to pass it up?" During that academic year, each department in the college described and defended to the entire faculty its contribution to undergraduate education. The discussions which followed that exercise resulted in a faculty consensus that the demonstrated value of any learning experience lies in the outcome for the student. We identified four broad expected outcomes of a liberal education — communications, problem solving, valuing, and involvement. During the next year, the faculty charged the curriculum committee with breaking the four outcomes into more detailed components. In the third year, a smaller task force, in dialogue with the faculty, shaped the expanded list of eight outcomes into a curriculum. In the fall of 1973, the entering class began its college experience with an outcome-centered curriculum focused on developing student abilities in eight major areas of competence:

1. Effective communications
2. Analysis
3. Problem solving
4. Valuing
5. Effective social interaction
6. Effectiveness in individual/environment relationships
7. Involvement in the contemporary world
8. Aesthetic responsiveness

These eight areas of competence have been, since 1973, the basis for organizing the curriculum.

The faculty see these areas of competence not as discrete skills but as interrelated qualities characterizing the liberally educated adult. We define them as qualities of the person — possession of them involves using them. They encompass both knowing and doing, knowledge and skill. Students become proficient at using these competences across a wide variety of settings and situations. Students are disposed to use them, are motivated to use them, and have certain attitudes and self-perceptions associated with the competences.

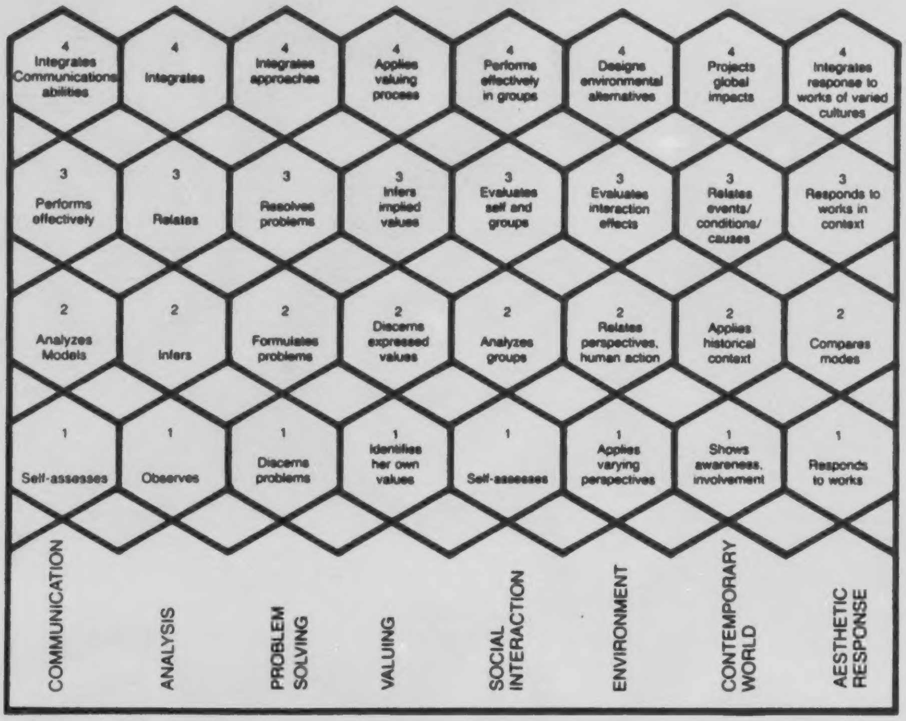
For example, students with the ability to communicate effectively understand the parts of effective communication (knowledge) and use these parts in their own communication (skill). In addition, such students use their ability habitually, whenever writing, speaking, reading, or listening (disposition). They take special care to communicate effectively (motivation) and believe in the importance of effective communication (attitude). Moreover, they see themselves as communicators (self-perceptions) who have certain strengths and weaknesses in communicating and are working to refine their performances in a variety of contexts, both personal and professional.

In order to help students develop their abilities to a point of identifying with them as their own characteristics, we have redesigned our educational framework. We see each academic discipline both as essential content of those abilities and as an area in which the student develops the abilities. In other words, we believe students learn biological and historical data better because they analyze them and communicate them. At the same time, students become better analyzers and communicators by exercising those abilities in varied fields like history and biology.

We came to realize that no one of the eight areas of competence we identified as the outcomes of a liberal education can be taught or learned directly in a single experience. Nor can they be divorced from the liberal arts curriculum of which they are the outcomes. The faculty, therefore, further analyzed each competence into a sequence of six levels at which students would be expected to demonstrate their abilities as they progressed through the undergraduate curriculum.

The first four levels of each competence are shown in Figure 1. Those four levels are to be mastered in the first two years of college. They represent this college's definition of basic skills for success in adult life. Levels five and six are more specialized applications of the competences, to be mastered in the student's area of concentration in years three and four.

We identified these competence levels by examining the existing curriculum in each of our disciplines. Traditionally, each department had described its curriculum as a structure of knowledge, beginning with basic general con-



	COMMUNICATION	ANALYSIS	PROBLEM SOLVING	VALUING	SOCIAL INTERACTION	ENVIRONMENT	CONTEMPORARY WORLD	AESTHETIC RESPONSE
4	Integrates Communications abilities	Integrates	Integrates approaches	Applies valuing process	Performs effectively in groups	Designs environmental alternatives	Projects global impacts	Integrates response to works of varied cultures
3	Performs effectively	Relates	Resolves problems	Infers implied values	Evaluates self and groups	Evaluates interaction effects	Relates events/ conditions/ causes	Responds to works in context
2	Analyzes Models	Infers	Formulates problems	Discerns expressed values	Analyzes groups	Relates perspectives, human action	Applies historical context	Compares modes
1	Self-assesses	Observes	Discerns problems	Identifies her own values	Self-assesses	Applies varying perspectives	Shows awareness, involvement	Responds to works

Figure 1. The first four levels of each competence

cepts and progressing toward more complex and specialized studies. In revising our curriculum, we worked from the assumption that there is also a progression of competences implicit in the movement from introductory survey to advanced seminar. Rather than redefining our fields or creating a whole new curricular structure, we directed our efforts toward discerning the developmental patterns already embedded in our disciplines.

Assessment of Competences

After we had identified the competences and articulated their sequential levels, the question became, "How can we tell how far along a student is in developing these competences?" It would be pointless, we realized, to have spent so much time and effort identifying and articulating our educational goals unless we were willing to make a similar investment in assessing their attainment. Thus we arrived at assessment as a natural and crucial part of our approach to liberal education.

Once we had come to see our purpose as helping students develop their abilities, we needed tools to evaluate student performance, tools that would not simply ask, "What do these students know?" but, "What can they do with what they know?" This led to more difficult questions than traditional paper-and-pencil testing methods could probe. We could no longer rely on seeking right answers, or asking for repetitions and reformulations of memorized information. Our assessment techniques would have to challenge students to show their developing abilities in the best and broadest manner of which they were capable.

Our outcome-centered view of education also considerably deepened our understanding of the two classic functions of testing — to credential and to diagnose. We needed assessments reliable enough for us to stand accountable before other educators, both inside and outside our college. We also needed assessments sufficiently specific and detailed for the students and their instructors to plan further learning experiences effectively. Yet we could never afford to lose sight of the ultimate *raison d'etre* for assessment: to provide the students, at each step in development, with fuller and more individual profiles of their emerging combinations of gifts, skills, and styles — enabling each student to become an independent learner.

It would have been pointless, we realized, to have spent so much time and effort identifying and articulating our educational goals unless we were willing to make a similar investment in assessing their attainment. Thus we arrived at assessment as a natural and crucial part of our approach to liberal education.

Finally, we had come to focus on outcomes by acknowledging that learning's value lies in its enduring impact on the learner. This reflected our longstanding intention to foster habits of mind and action that would shape and enhance our students' lives and environments beyond the college experience. Our assessments, then, would have to provide some assurance that the abilities students showed were at some point becoming personalized, part of their habitual ways of handling situations in their personal and social, as well as academic and professional, lives. And we realized that within the developmental perspective we had established, we would need to make assessment itself a teaching tool. We accomplished this by making assessment techniques and criteria public and explicit and by presenting the results to the student immediately and in detail in a structured feedback situation.

We decided on the following procedure (which is still in effect). At the beginning of each course, the instructor spells out the course goals in the syllabus, including the competence levels a student should be ready to demonstrate as a result of the course experience. In the syllabus, the instructor relates the particular materials and assignments to the course goals. The syllabus also specifies the assessment techniques that will be used and enumerates the criteria upon which the students' work will be judged. During the course, as soon as possible after each assessment, the students receive detailed feedback on their performances in terms of the overall course goals and the specific criteria set forth in the syllabus.

Integration of Competences, Assessment, and Instruction

Inevitably, we realized that whatever is true of our assessment of student competence must also be true of the learning experiences we provide. Thus faculty members have had to rethink the course work in their disciplines — to specify which levels of competence could be contracted for in any given course. The faculty has begun to specify how course content is to be integrated with the competences, rather than taking for granted that competences are developed if the student "really knows the subject matter." In this rethinking process, faculty members have begun to design and implement learning strategies that insure student outcomes.

What all of this means is that the students are working in various ways to develop, whether from the vantage point of an introductory literature course or an advanced psychology course, the capabilities that will later characterize them as competent adults outside the college setting. If they are taking an introductory course in short fiction, for example, students learn not to leap to unfounded and irresponsible interpretations. They learn to observe literary data as carefully as biological specimens under a microscope or human behavior in the psychology lab. When they derive inferences from those facts, students learn how much evidence is necessary before they can draw responsible conclusions. They learn how to bring stories into meaningful relation with their own lives and with life in general.

Students' conclusions about a story are as much a reflection of the process of testing and learning to understand their own values as they are a response to the values of the author and of the characters in the story. At the same time that they are reflecting upon the value systems of others in relation to their own, students are becoming increasingly sophisticated in the use of communications techniques by learning to express more complex conclusions for audiences less informed, as well as for their peers and their teachers.

The context for learning might be a group problem-solving situation or an individual analysis. The assessment might consist of a simulated public defense or an arraignment of a character in a given story. Such an assessment would be designed to elicit behavior that would enable students to demonstrate levels of critical thinking, communication, and valuing ability.

The holistic nature of the abilities being developed and assessed in such a situation suggests what we aim for throughout the curriculum. We see these abilities as attributes of the individual — not simply abilities specific to a task or situation. Although students learn and demonstrate these abilities in specific settings like a chemistry lab or a simulated corporation, they should be able to transfer and adapt them to a variety of situations. Thus, students must learn competences and be assessed for them in multiple settings. Students must also be able to demonstrate abilities in external situations — that is, to people other than teachers and peers, and in contexts where they have learned them. In specific instances, therefore, students are assessed by teams including business and professional persons from the community, alumnae, and students.

Because human abilities are integral parts of the whole person, they operate in concert. However, at times — especially in initial stages of development — we render them more manageable by separating them for the learner, teacher, and assessor. Students who cannot draw inferences from their observations, for example, need to work precisely and specifically at making such inferences. That is why we have specified the abilities we require our students to develop as separate though overlapping areas of behavior. That is also why we have analyzed the desired competences into levels and component abilities.

The sequential levels of the abilities are cumulative in both experience and assessment. Each level builds upon and includes the prior levels, and students have frequent opportunities to further evaluate and refine abilities which they have already demonstrated. Indeed, we coordinate our instructional efforts to insure that this occurs. As they undertake to specify increasingly complex relationships among world events (a developing level of involvement in the contemporary world), for example, students must begin interweaving the separate historical backgrounds of such events — a sophistication of their proven mastery of a prior level (the ability to explore a single event's historical context). Prior levels of ability are thus not only reinforced, but are drawn into more and more complex uses.

At the same time, learning and assessment look beyond the level at hand. In each course or individual learning experience, and in each assessment situation, we attempt to elicit from the students the most advanced performances of which they are capable. For example, while keeping journals to find and make explicit what their values are (first level of valuing), students are likely to explore their actions, their aesthetic preferences, or their religious heritage. They might record reflections on various products of our technological age, from modern medicine to transistor radios. The instructor would examine the journals according to the criteria for the first level. In addition, the instructor would point out where the students have discerned expressed values in artistic and cultural works (second level) or have inferred value problems implicit in technology (third level). The feedback would thus show students where they are already developing abilities beyond those for which they are seeking validation.

The unlimited possibilities for exhibiting competence are even more evident at the advanced levels. Here the students help design or select highly complex assessment situations, often in professional or other field settings, which challenge their abilities to the fullest.

The criteria by which the student's performance is judged are necessarily specific to the level for which validation is sought. But with precise observation as a basis, the assessor can offer feedback on the broader implications of a student's performance. In recording exact information about a student's performance, assessors may be called on to judge whether a given element is present or absent, to quantify its frequency, or to use a rating scale. They are always expected to note illustrative examples. In both qualitative and quantitative measures, however, we take care not to place a ceiling on the degree to which a student may excel in demonstrating the criteria involved. Indeed, our constant emphasis in teaching and assessing is to encourage students to go as far as they can with their developing abilities at every opportunity.

The fact that the abilities and their assessment are by nature integrated is most apparent at the advanced levels. Early assessments are fairly limited, in order to focus the student's attention (both as a performer and as an assessor) on a particular element of a single ability. By the time students are working at advanced levels, however, we are looking explicitly at several abilities operating interactively.

When nursing students are ready to attempt advanced levels in problem solving, they invite instructors into the field setting for clinical co-assessment. At such a time, students may choose to seek validation for social interaction, problem solving, and valuing at the same time. Their written nursing care plans for clients record their command of problem solving as applied to nursing. As nursing students deal with their clients face to face, they carry out their plans for problem solving and also display their interactive abilities. In diagnosing patients' needs, assigning priorities to these needs, and evaluating their plans and their effectiveness, students also apply their abilities in valuing. Based on information from the students' nursing care plans, the co-assessors' careful records of clinical performance, and the students' own critiques of their work, we can assess students in all three competences: social interaction, valuing, and problem solving.

In like manner, English students seeking to demonstrate abilities at advanced levels are given week-long simulation exercises. At this level they must be able to analyze, respond to, and evaluate complex literature that represents a variety of writers and historical periods. They must also be able to extend to human experience in general their understanding of the many points of view that they have encountered in the context of their experiences with literature.

For example, working two to three hours a day with several peers as the staff of a fictitious community cultural center, students might handle a variety of problems. While planning an upcoming literary festival, they might be asked to step in as emergency substitute teachers in adult classes on Elizabethan plays. They may have to deal personally (on videotape) and in writing with a benefactor's repeated attempts to influence the poetry selections for the festival. On short notice, they may be sent to appear on radio talk shows (also videotaped) to respond to citizens who call in to criticize city plans for razing a block of tenements in order to expand the center.

The effort to rethink our ideas and change our practice, however difficult and demanding, has resulted in our becoming more effective in recognizing the uppermost levels of potential for the adult learner — for we deal in maximum rather than minimum competence.

In a variety of ways, these English students are called on to apply their literary knowledge, their ability to define and defend criteria for judging works, and their understanding of the impact of literary art on its audience. At the same time, they must frame and deliver complex messages to varying audiences using several media. And they must draw together a variety of works in terms of their commonalities and contrasts. The written, sound-taped, and videotaped records of the week's work thus provide an ample basis for assessing the students' abilities in three different competence areas — aesthetic response, communication, and analysis. In addition, we see this assessment experience as an integral part of instruction and expect the students to learn during the experience and to use feedback from the experience to help direct further learning.

Beyond enhancing the immediate value of our assessment techniques, our insistence on a holistic focus has helped to remind us of the surprising variety of ways in which a given ability can be demonstrated. Our students' myriad variations upon the theme set by a given instrument continually broaden our awareness of what to look for, as well as provide concrete evidence of our students' own unique, developing styles. We are thus enabled, as assessors, to appreciate a wide range of possible definitions for "successful performance." We also learn more about how to design our assessment experiences to elicit the richest possible response.

Does What and How We Teach Make a Difference?

How successful have our efforts been to define the holistic abilities of adults and to teach and assess them? We have established an evaluation arm in our curriculum to insure its continued development. Our Office of Evaluation has taken the responsibility of conducting a number of research and evaluation studies to examine the extent to which the abilities learned in a college make a difference in the future personal and professional success of its graduates. These studies, funded by the National Institute of Education, are designed to validate the selection of expected outcomes of college and to illuminate how a college education can affect the development of adult competences.

We are also cooperating with professional groups off campus to build a bridge from the college to the actual work situations our graduates will enter. We are interviewing outstanding professionals in a number of work settings. We ask them to tell us what they do and to identify the capabilities they think are necessary for outstanding performance. We are beginning to create descriptions of those abilities that describe the outstanding nurse, manager, and educator — three career fields heavily selected by our graduates. These descriptions will be used by our faculty members to review their own decisions about which abilities are important in a given field, and to further develop instructional and assessment tools.

We are also building complex profiles of both personal and professional development in the college years and in later life. We interview students after each year in college. We find that we can assess many outcomes of the college experience through in-depth interviews — outcomes such as increased self-confidence, creativity, internalization and integration of competences, and the ability to transfer learning to personal as well as professional settings. We are assessing students on a variety of measures other than those developed by our faculty. By monitoring and describing student growth in terms of measures developed by others, we can begin to check on our success in preparing students for life after college. Our graduates seem to perceive themselves as lifelong learners who take responsibility for their own learning. This effort has helped us begin even more comprehensively those so-called intangible outcomes that educators expect to result from education.

The effort to rethink our ideas and change our practice, however difficult and demanding, has resulted in our becoming more effective in recognizing the uppermost levels of potential for the adult learner — for we deal in maximum rather than minimum competence. We also concentrate on each individual student — where that student is, where that student chooses to go.

Implications for Elementary and Secondary Programs

We believe our experience holds several implications for elementary and secondary educators who are struggling with many of these same issues.

- First, we believe that the earlier a student participates in an educational process that is developmental, the better.
- Second, we believe that assessment best serves students from the start, when — in addition to providing evaluation of their progress — it operates as a diagnostic tool, helping to form the teaching process.
- Third, we believe that students learn better when their development involves, as soon as possible, learning how to learn.
- Fourth, by identifying abilities and assisting students in developing them, we believe that we can better understand personal and professional potential in the individual.

- Finally, although we are just beginning and we still have far to go, we have observed what we believe are important outcomes at all levels of education — the intangibles of education, which transcend our list of competences. They can be enhanced by a carefully planned educational process.

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Skills for the Future

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Editors' Note: *In government and private industry, groups of experts are concerned with forecasting the future. The forecasts of these futurists have implications for what we should do in the present to be prepared for the future. In the first half of this paper, Lena Lupica reviews the forecasts for changes in the society's demands of school graduates and for changes in schools. In the latter half she discusses six categories of skills which are needed in a changing world and might be considered basic.*

Throughout the United States, a "back-to-basics" movement has taken hold which, if taken at face value by school administrators and school boards, may cause serious problems in preparing children for their adult lives. Why should the basics — reading, mathematics, writing, and now, with the new federal legislation, oral communication — be so emphasized at this point in history?

The popularity of the back-to-basics movement appears to have a number of explanations. It is a cry to reverse the low achievement test scores received by students in the last fifteen years.* The cry, "Back to Basics," helps quiet the complaints of college professors who argue that many entering students are lacking in basic reading and writing skills. In many instances, the movement is a demand to "cut out the frills," along with the educational innovations encouraged in the 1960s, and to reduce the cost of education. Fueled by the general taxpayers' revolt — especially against high property taxes which support local school districts — the movement may reflect the fiscal conservatism currently predominant in our society. It may also be considered a request for a simpler, less complicated life and a return to traditional methods of teaching (that is, teacher-directed lectures and authoritarian discipline). Whatever the reasons for its popularity, the back-to-basics movement should be viewed with concern, because it will not adequately prepare individuals to live in the future.

By using the tool of trend forecasting and analysis, the need to teach students other basic skills becomes apparent. The future cannot be predicted with certainty; nevertheless, reasonable forecasts of developing trends in the social, political, economic, and technological fields can be made. Analyzed together, trends in these areas will help surface emerging issues and societal needs. A brief view of a few major environmental trends demonstrates the need to teach individuals the additional skills of coping with change; anticipating alternative future developments; knowing how to learn; using computer, voice, and visual equipment; developing human relations skills; and learning effective citizenship skills.

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*Although it is clear that standard achievement test scores have fallen steadily in the last fifteen years, the causes for their decline are uncertain. The educational innovations of the 1960s are not the only possible reasons for the declines. Other factors such as the effects of child-spacing, early childbearing, and the influence of television have been given as plausible explanations for the low test scores.

Major Trends

We live in an age of rapid and accelerating change, an age of increased complexity, in a world with finite resources. This rapid change can be placed in perspective if we look briefly at how humans have progressed technologically over time. It took our ancestors hundreds of thousands of years to move from the hunting and gathering stage to the agricultural stage, approximately ten thousand years to develop and spread agriculture through most of the world, two hundred years to develop a scientific and industrial civilization, and less than fifty years to bring about an electronic revolution that processes and sends information around the world instantaneously. The next revolution, in the biomedical field, may occur in less than thirty years and may alter our perceptions of life itself. Science and technology, the driving forces for many social changes, will continue to have an increasingly significant impact on our lifestyles, our survival needs, and our values.

Science and technology, however, are not the only factors which change our lives. Social factors such as exponential population growth patterns (incremental growth similar to that of interest on savings accounts) also play important roles (Pirages and Ehrlich, 1974, p. 3). From the beginnings of human life to 1650 A.D., world population reached half a billion. By approximately 1850, two hundred years later, that figure had doubled. By 1930, a period of eighty years, it had doubled again, to reach two billion. By 1975, a scant forty-five years, world population reached four billion. The Population Reference Bureau shows a current annual world population growth of 2.05 percent, an increase of 172 individuals per minute (a total population doubling time of forty-one years) (Little and Roth, 1979, p. 8). According to current conservative United Nations projections, world population will reach 5.8 billion people in the year 2000, 9 billion people in 2025, 11 billion in 2050 and level off at around 12 billion by 2075 (Little and Roth, 1979, p. 9). A higher estimate given in a report of the House Select Committee on Population of the United States Congress states that if present population growth rates continue, there will be 8 billion people on earth in the year 2018, 16 billion in 2058 and 32 billion in 2098. Population growth patterns will, of course, influence housing needs, food needs, production capabilities, environmental pollution, and future economic growth rates.

Although the United States has reached below zero population growth, the more rapid population and economic growth rates in foreign countries will place pressures on Americans. These pressures may come in the form of demands from developing nations for goods, natural resources, improved health, better education, and guarantees that they can keep their cultural identities. Unless developed nations can formulate a policy of interdependence rather than the present policy of self-reliance and isolationism, the international scene will see much turmoil in the next twenty years. Our educational system can improve the international situation by teaching skills in interpersonal relationships and emphasizing cross-cultural understandings, the interdependence of nations, and the value of international cooperation.

The interdependence movement is directly affected by the economic growth policy. There are limits to the earth's natural resources, especially when humans use some materials (for example, fossil fuels such as coal, gas, and oil) at much faster rates than nature replenishes them. By social choice and political action, most industrialized countries are moving away from the concept of unlimited, careless growth. In the United States, the movement toward more "ecologically compatible" growth, or "sustained" growth, is demonstrated in the personal choice of smaller families and a birth rate below zero population growth level ("Human Resources," 1980, p. 9); in community opposition to new power plants, shopping centers, dams, and highways; in political action such as mandated standards for land reclamation after strip mining, and pollution-abatement laws; and in personal lifestyles directed toward simplicity and the use of appropriate technology (renewable, energy-efficient, recyclable, and non-polluting technology). The educational system can prepare individuals for an ecologically compatible growth environment by teaching coping skills.

Movements toward interdependence, cooperation, and "sustainability," coupled with growing concerns for human rights, the assimilation of the post World War II "baby boom" generation into the workforce, and a shift in values will have an impact on the quality of work life. Some businesses are realizing a need to demonstrate social responsibility both in the workplace and in the community. They see American productivity eroded by increased job stress, lower motivation to work, poor health, escapist drinking and drug habits, increased labor turnover, and absenteeism. A large proportion of the population and the workforce in the United States will be in the prime age category (25-44) in the next twenty years ("Human Resources," 1980, p. 12). By 1990, they will be approximately 80 million in number, 30 percent of the population and 50 percent of the labor force. These people will be more educated than past generations, and many will hold values that show concern for individualism over conformity, diversity over uniformity, experience over materialism, persons over institutions, participation over authority, and quality over quantity.

Our educational system can improve the international situation by teaching skills in interpersonal relationships and emphasizing cross-cultural understandings, the interdependence of nations, and the value of international cooperation.

Many in the present work force are beginning to revolt against jobs broken down to their simplest elements, assembly-line work, specific and detailed job classifications, organizational inflexibilities, and standards set by management alone. Some are beginning to change the work environment by demanding worthwhile and meaningful work, a chance to grow in a job, a share in managing their job and work environment, a stake in the organization, and a place on the board of directors. Modern workers appear to be genuinely concerned for the quality of items produced or services rendered. Such concepts of freedom and democracy emerging in the workplace indicate a likely change in the future working environment and in the skills which must be learned in school.

These are not the only trends which will influence our educational system and determine the skills needed by people in the future. A brief sentence or two on other trends will further emphasize the importance of providing appropriate basic skills to meet future student needs:

1. Young people (16-24 years old) entering the labor market after 1985 will find advancement into middle management positions difficult. Such a situation will require revised career expectations and thoughtful career planning.
2. Cultural diversity will continue to grow. The overt advocacy of beliefs which only ten to twenty years ago were frowned upon demonstrate this continuing trend. The adoption of alternative lifestyles is also indicative of this trend. More people are living alone. Single parenthood is on the rise. Laws are being passed to safeguard the rights of children. There is growing acceptance of mixed racial and religious marriages. And corporate family and communal life are becoming more popular. Only about 15 percent of the population of the United States remains in the traditional family unit with two parents and two children ("Household . . .," p. 28).
3. Ethnic and language diversity is rising with the migration of Mexicans and the acceptance of Vietnamese and Cuban refugees into the United States.
4. More women are seeking paid positions. By 1990, 60.4 percent of women in the United States may be in the work force — an increase from the current 50.7 percent.
5. There is evidence that the United States is losing its position of technological leadership to such countries as Japan and West Germany. U.S. power in the future may lie primarily in its ability to control and to manage information.
6. There is a movement toward "educational packaging" and more use of technologies, such as holographic techniques, voice/video technology, and computer-based instruction systems which help diversify the educational

process and allow Americans to become an oral/visual society.

Basic Educational Skills for a Changing World

What do all these changes mean for a child who is trying to live in this world of rapid change and to prepare for adult life? In the past, stress and disorientation appeared to be problems of adults. However, the insecurities of a world in transition are now causing symptoms of these same conditions among a large number of children. What basic skills can children learn to help them reduce the daily tensions they feel and improve their quality of life? It appears that there is need for a broader definition of basic skills to include:

- Coping with change
- Anticipating alternative future developments
- Knowing how to learn
- Using computer, voice, and visual equipment
- Developing human relations skills
- Learning effective citizenship skills

Coping with Change. To develop the ability to cope with change, individuals must be cautioned against striving exclusively for mastery of a very limited set of knowledge and skills. Ongoing changes in work and society require that most persons be prepared to make major changes in their lives — changes often requiring some version of lifelong learning. Eugene Schwartz in his book *Overskill* shows that excessive specialization is self-defeating. Civilization cannot be saved by a group of highly trained specialists who do not understand other fields or even themselves.

Diversity and openness to change are essential ingredients in creating a personal coping mechanism. Those who are diversified will have fewer problems in finding new occupations when their old jobs are replaced by automation or are eliminated (Bowman and Pulliam, 1974). Openness to change involves a willingness to take risks, especially the risk of learning about oneself. Coping skills, for example, may include stress-management techniques such as relaxation and biofeedback; efforts to attain self-understanding and a positive self-concept through values clarification, human interaction workshops, and psychology curriculum; efforts to learn the value of other people by accenting the concepts of cultural pluralism and global interdependence; and efforts to master techniques for anticipating change, seeking alternatives in one's personal future, and transferring the knowledge to more general developments in life.

Anticipating Alternative Future Developments. Learning coping skills is directly related to anticipating possible future developments. We must educate students to study future possibilities by making them aware of major issues and developments that are highly probable, and having them analyze the short- and long-range problems and opportunities these issues will raise. Through this process, they can learn to deal with uncertainties and to choose wisely among alternatives.

According to Alvin Toffler (author of *Future Shock*), the habit of anticipation is more important than specific bits of advance information. After all, we are in general much less shocked by, and much better able to cope with, situations which we have considered in advance than we are with developments which are totally unexpected. If we think through six alternative possibilities in advance and only one of them occurs, we are still better able to cope than if we had considered none of the possibilities. Thus, successful coping may well lie in a sense of the future, because people can then better prepare for any dislocations and stresses brought on by rapid change (Kauffman, 1976).

Knowing How to Learn. The skill of learning how to learn was valued by the late anthropologist, Margaret Mead. Knowing *how to learn* is a *process* skill, while knowing *what to learn* is a *content* skill. In the future, we will need individuals who have been trained to think rather than to remember. Increasingly, the information one learns in school may become dated, irrelevant, or useless. Further, students will not be able to memorize the vast amounts of information generated by extended computer capacities. Educators must realize that 80 percent of factual material is forgotten within the first six months after it is memorized (Miller, 1978).

Thus, our continuing effectiveness resides in our ability to learn how to find, obtain, and use information resources which provide the latest data necessary for solving problems or taking advantage of opportunities. These process skills help learners think analytically and intuitively, which in turn helps them organize their thoughts, define problems or opportunities, ask the proper questions to reach solutions, understand relationships and connections among materials, synthesize information in a holistic manner, and choose the best solution(s) among the alternatives. Process skills also provide the learner with the ability to observe and recognize inconsistencies in data, propaganda techniques, advertising strategies, and consumer product information. It is through the skill of learning how to learn that we may preserve what Buckminster Fuller (architect, scientist, and inventor) thinks is "natural and instinctive in human beings — an insatiable desire to learn" (Hostrap, 1975).

Using Computer, Voice, and Visual Equipment. Individuals will continue to seek and to communicate knowledge in the future, but increasingly it will be stored in electronic form rather than in books. Computers and voice and video cassettes are competing with the written word as a new means to store and send information. The present generation of computers can store more information in less space and communicate more quickly than any form of printed matter. It is hoped that the next generation of computers will be still faster, lighter, cheaper, and more reliable. Common sense, the expense of paper, the lack of space, efficiency, and competition will force more libraries, businesses, and government agencies to store in computers the increasing amount of information generated in our society. The rapid proliferation of knowledge is intensifying the shift from the production economy representative of an industrial society to the service economy representative of a post-industrial society.

As this process continues, the demand for people with computer literacy — the ability to understand the basic functioning of a computer and to use a computer terminal — will grow. Currently, 50 percent of all occupations in the United States are in some way connected with the accumulation and processing of information. Earl Joseph (staff consultant and futurist at Sperry Univac, Division of Sperry Rand Corporation) estimates this percentage may rise to 80 or 90 percent of the entire work force in the United States by 2029 (*Business Week*, September 3, 1979).

Technological advances in data processing and the movement toward a service-oriented society are having an impact on skills presently considered basic. Low-cost calculators have already eliminated the need to do mathematical computation. Now, with an understanding of mathematical processes and the operation of a calculator, most individuals can function in society without some of the basic skills of mathematics. Furthermore, they may function more efficiently than before and have increased time for leisure activities or work. Might not writing and reading skills be similarly affected by new technology? The Kurzwell Reading Machine (an experimental computer designed to help the blind) scans pages, recognizes letters and words, applies phonetic rules, discerns phrase boundaries (using syntactical and vocabulary knowledge), identifies stress and accent marks, and synthesizes it all into words and sentences as it goes along (Hoover, 1979). At the IBM Yorktown Heights Research Center in New York, researchers are trying to produce a voice-driven typewriter which will grapple with unconstrained, natural language. According to Rex Dixon, IBM's speech-processing consultant, "a usable continuous-speech-recognition system working with talkers, natural grammar and large vocabularies may be ready in 15 or 20 years" (Hoover, 1979).

Individuals will continue to seek and to communicate knowledge in the future, but increasingly it will be stored in electronic form rather than in books. Computers and voice and video cassettes are competing with the written word as a new means to store and send information.

Voice and video equipment is also in a state of constant improvement and miniaturization. Video cassette systems can be attached to television sets to tape programs for replay at a later date. Systems have been developed to tape a program on one channel while the viewer watches another channel and to tape programs when the viewer is not able to be present for them. Another more elaborate visual system currently under research is holography, a system that projects three-dimensional forms.

In the voice department, tape cassettes have been produced which are the size of a matchbox. It is only a matter of time before these instruments are within the buying power of the average American. They are already within the purchasing range of schools and businesses and can be used to improve service and learning. Needless to say, students can be better prepared to work with these devices.

Developing Human Relations Skills. The benefits of new voice, visual, and computer technologies are extensive; however, the use of these devices may also have social disadvantages which reduce face-to-face communication and produce alienation among individuals within American society. Development of human relations skills, especially interpersonal communication skills, can act to reduce the negative impact of communication technologies.

The emphasis placed on reading and writing has at times blinded educators to the value of listening and speaking skills. Yet, at the heart of good human interaction is the ability to communicate verbally — to express and share thoughts, needs, and wants. Educators can provide conscious and direct efforts to help students organize, describe, and, when necessary, sell their ideas orally. Students need to practice such skills in nonthreatening environments and to begin at an early age rather than waiting to learn these skills when a job, interpersonal relationship, or another important concern is at stake.

The ability to relate well to others is vital for anyone who works with people. The movement toward a post-industrial society heightens the value of this skill, since good human relations and communication skills are needed to provide services and to manage people.

Improved oral communication and human relations skills will also contribute to students' ability to cope with future social and technological changes and value shifts, since they will be better able to express the changes they feel or see. In turn, such self-expression reduces alienation and the possible discomfort of communicating ideas or meeting new people.

Learning Effective Citizenship Skills. Americans are coming to the realization that the decisions and policies made today will have a long-range impact on our lifestyles, our social institutions, our communications and information systems, our technological innovations, our natural resources, our belief systems, and even our concepts of the nature of life. In response to this realization, citizens are demanding a share in the decision-making process and are holding their institutions accountable for their actions, even to the point of creating new institutions and organizations where the old ones no longer function for their benefit. For example, holistic health clinics have gained popularity as a means of preventing illness and reducing health costs.

The power structure in the United States is changing, making citizen participation more important. Our society is becoming decentralized; thus, increased interest and participation in government is growing at the grassroots level and decreasing at the national level. Today, national legislation is sometimes written with the mandate that federal agencies conduct local public hearings on issues under their consideration. For example, the Office of Technology Assessment in Congress and the Department of the Interior in the executive branch must include public participation in their studies. Students today can be better prepared to take part in the decisions of their community — local or national, personal or public — by learning citizenship skills.

A number of citizenship skills can be taught and practiced in the educational environment. These include learning practical methods of participating in government and community decisions (that is, who to approach, how to make contact, and how to organize an intelligent response to an issue); learning techniques for reaching consensus; developing leadership skills; learning the arts of compromise and reconciliation; and recognizing the ways in which different people within the community, society, or culture are interdependent. One of the most important skills of citizenship is the ability to keep communication channels open among all interested groups. This makes re-evaluation of the goals and objectives set by citizens infinitely easier (a valuable outcome in light of accelerating change).

By developing citizenship skills and combining them with a future consciousness, we are creating a citizenry ready for the future — a citizenry which recognizes that many problems require work with politicians, business people, scientists, and educators to achieve effective, long-range solutions (Bezold, 1978).

Conclusion

The rapid, complex, and pervasive nature of today's change has created a period of transition — a period in which new basic skills, in addition to the three R's, are needed for survival. The educational system can successfully help Americans move through the transition from an industrial to a service and information-oriented society by setting curriculum priorities which reflect emphasis on skills needed for the future.

Some courses necessary for the development of these skills already exist in the educational system; others could use more emphasis. Among the existing courses are the sciences, economics, government, cross-cultural studies, psychology, sociology, debate, competitive sports, foreign languages, music, and English. Additional emphasis could be placed on studies of the environment and resources, future studies, the biological sciences, computer science, social change, communications, communication technologies, international development, cooperational sports, and the citizen as a force for change. Most important, the curriculum emphasis must evolve and change to meet new basic-skill needs reflected in an ongoing analysis of societal trends.

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Classroom Monitoring and Assessment

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Editors' Note: *This paper deals with one of the crucial elements found in effective schools. According to the studies reviewed later by Samuels, the most important finding related directly to instruction was the importance of regular assessment of definable and assessable skills* with use of the assessment data to influence instruction. *This is sometimes interpreted to mean that there must be a subskills focus. The research, however, does not confirm that. The writers of this paper and several other writers (including Goodman, Taylor, Jandt, Newkirk) indicate that other important skills can be assessed and the findings used to inform parents and to direct instruction. The underlined phrase above has three major implications: (1) assessment data must be collected frequently enough to be useful in directing instruction; (2) data must be available immediately so as to influence decision making; and (3) the data must be relevant to instruction. Vito Perrone and Walter Haney emphasize that assessment data must be related to what has been taught and what is to be taught. For more formal testing, this is usually thought of as criterion-referenced testing. For informal assessment, the teacher should be able to see and discuss with parents the relationship of the assessment to instruction.*

Introduction

An important challenge for teachers and schools is to communicate more clearly what their purposes are in relation to the basic skills; how they propose organizing to support those purposes; what procedures they plan to use to assure children's acquisition and growth in the basic skills; and how they will report to parents. While this is not a new challenge, it needs greater attention if schools are to regain the confidence of the parents and communities that support them. And the "greater attention" is ultimately dependent on thoughtful, well-organized assessment practices.

We wish to make clear at the outset that assessment needs to be addressed broadly in schools, encompassing more than basic skills concerns; however, for the purposes of this paper, we will focus our attention on assessment of the basic skills as traditionally defined. Our discussion is organized principally around (1) informal assessment procedures, including record keeping, and (2) norm-referenced and criterion-referenced tests. Our suggestions are directed primarily at individual teachers and are related to the classroom. In closing our discussion, we have directed some attention to ways in which assessment might serve to bolster a school's overall improvement efforts.

Informal Assessment and Record Keeping

We begin with informal assessment and

record keeping because they have considerable potential for helping teachers become very aware of children's development and for giving direction to teachers as they plan ongoing instructional programs. Another reason for beginning here is that teachers often make use of such information but have not been as confident about how to make use of it in an overall assessment program.

In schools which have made a consistent, long-term commitment to careful record keeping (and this is not yet common), teachers can learn a great deal about the status and pace of their children's growth in the basic skills from the reports of previous teachers. The report on a child prepared by the previous years' teachers might include lists of books read, samples of writing over a period of time, examples of mathematics concepts and applications which the child understands, results of reading inventories conducted on an individual basis, and summary evaluation statements about the various skill areas. (We have refrained from commenting at this time about scores on standardized tests. The kinds of reports under discussion, however, would include all available test scores.) These kinds of records — and no attempt was made to be all-inclusive — should provide teachers with some important insights about where children stand in relation to the basic skills and suggest a broad array of starting points in relation to curriculum.

In order to gain more personal understanding, as well as to establish baseline data for the year, teachers might administer a variety of informal assessment instruments and exercises in the basic skills. In the area of reading, for example, teachers might use one of the published informal reading inventories (Silveroli, 1973, or McCracken, 1972) or an inventory that the teachers themselves might develop (using a passage from a popular trade book enjoyed by children at the relevant grade level) to determine how well a child reads, the kinds of difficulties, if any, which the child experiences, and so on. This kind of assessment activity typically requires a child to read a passage silently, describe orally what the passage is about, read the passage orally to the teacher, and then add orally to the earlier description. Each published form includes a scoring mechanism based upon the frequency of errors, which permits the teacher to categorize the child's reading level. A useful aspect of the published inventory is that parents can duplicate the process, gaining as a consequence some of the same insights as the teacher. Another procedure to examine reading ability is the Miscue Analysis, developed by Ken and Yetta Goodman (1972), a linguistically based assessment activity which focuses on comprehension and gives teachers some direction in relation to subsequent instruction. This assessment process provides teachers with excellent information about the reading strategies that a child brings to print material.

. . . teachers who document children's learning through carefully organized records tend to become more knowledgeable about children and learning. They become the "students of teaching" that schools need and parents desire. Teachers who are able to describe children's learning in great detail are teachers who are trusted, who can help establish and maintain parental confidence in the schools.

In the areas of mathematics and writing, a variety of assessment activities, constructed around the curriculum materials and content related to the particular grade levels of the children, can be developed easily by teachers. In mathematics, these might include a sampling of math symbols, computational exercises, and problem-solving activities undertaken in a conference setting with the teacher. In writing, children might be asked to engage in several different activities, permitting the teacher to gain some understanding of the child's use of language, range of expression, and so on. Brenda Engel's *Handbook on Documentation* (1975) and *Informal Evaluation* (1977) provide a large number of examples of informal assessment in all of the basic skills areas.

After some baseline information about children's skills, interests, and learning styles has been collected, it is important for teachers to set up a record-keeping system that requires periodic input on individual development during the course of the year. Such a record would include results of assessment activities of the type described above, samples of the child's work in writing and mathematics, lists of books read and understood, and audio tapes which demonstrate the child's reading or language abilities.

These records, which show growth in basic skills over the course of a year, and which are cumulative over the years the child is in the school system, should assist teachers in their instructional planning, for example, in making decisions about grouping patterns or determining enrichment needs. These efforts can also assist teachers in identifying children with unusual difficulties in reading, mathematics, and writing — children who may well need additional assistance. Aiding the learners, after all, is the principal reason for maintaining careful records.

The records can also serve as the basis for periodic conferences with parents, as well as for written reports to parents. Too often in their conferences with parents teachers have insufficient concrete information on which to build constructive interaction. The record-keeping process might also illustrate for parents a way that they can follow their children's progress more closely.

In addition to the benefits discussed above in relation to systematic record keeping, it is our experience that teachers who have begun to document children's learning through carefully organized records tend also to become more knowledgeable about children and learning. They become the "students of teaching" that schools need and parents desire. Teachers who are able to describe children's learning in great detail are teachers who are trusted, who can help establish and maintain parental confidence in the schools.

Standardized Tests

Schools typically make use of some kind of formal testing program in which norm-referenced or criterion-referenced tests are administered in the fall or spring. Typically such tests assess children's skills in such areas as reading, language arts, spelling, social studies, mathematics, and science. The most widely used standardized tests in schools are *norm-referenced;* examples are the Metropolitan Achievement Test, the Stanford Achievement Test, the California Achievement Test, the Iowa Test of Basic Skills, and the Comprehensive Test of Basic Skills. These norm-referenced tests are designed to measure children's achievement relative to that of other test takers who were part of a national sample (norm) population. We will focus most of our attention here on norm-referenced tests, since they are so heavily used in schools. Criterion-referenced tests, however, are increasing in popularity.

Before we discuss the uses of norm-referenced tests, we believe it would be instructive — especially for parents — to comment briefly on the forms in which test results are reported. In the process, we will point out some of the problems of interpreting the results of norm-referenced tests in order to assure sufficient understanding to attend to the rising concerns about the misuse of such tests.

Norm-referenced test results are reported as (1) percentile scores, (2) stanine scores, or (3) grade-level equivalency scores. The score of 43 correct answers (the raw score) out of 80 items on the language section of a very popular achievement test (1974 version) taken at the end of the seventh grade may be converted to a *percentile score* of 52. This indicates that 52 percent of those who took the test as part of the norm population scored 43 or less and 48 percent scored higher than 43.

Stanine scores, unlike percentile scores and grade-level equivalency scores, are suggestive of a range (for this reason test publishers are increasingly encouraging their use). A stanine score is developed by organizing percentile scores into nine groups. A stanine score of 5, encompassing 20 percent of the percentile scores, is considered average; 40 percent of the scores will then fall above this average and 40 percent below. On the test mentioned above, the percentile score of 52 falls within the fifth stanine, along with all percentile scores between 40 and 60.

The *grade-level equivalency score* is derived essentially by assigning to the median raw score of a seventh-grade norm population a grade-level equivalency of 7.0. Scores above and below the median are assigned grade-level equivalencies above and below 7.0. These assigned grade-level scores represent an estimation, nothing more. The score of 43 on the language section of the test under discussion (taken at the end of the seventh grade), which converts to a percentile score of 52 and a stanine score of 5, produces a grade-level equivalency score of 8.3 (eighth grade, third month).

The publisher of the test from which the foregoing derivations are taken lists a *standard* error for the language section as 3.9. This standard error indicates that two thirds of the time one could expect a raw-score fluctuation of 3.9 for a given student. As the test manual (Stanford Achievement Test, 1976) notes, "We could expect with about 68 percent certainty that the true score (for a student with a raw score of 43) would fall between [39 and 47]." This is between the 44th and 60th percentiles, or stanine 5; the grade-level equivalency range, on the other hand, is 7.2 to 8.9. The point of all of this is that *the scores are very imprecise; one has to be very careful in attaching too much importance to them.*

Of the three derived scores, grade-level equivalency is the most commonly used, even though it is the most misleading. Test publishers now regularly point out in their manuals that grade-level equivalency scores are being questioned as an appropriate means of interpreting the test performance of individuals and groups . . . In some cases they admonish users not to report grade-level equivalencies at all.

Of the three derived scores, grade-level equivalency is the most commonly used, even though it is the most misleading. Test publishers now regularly point out in their manuals that grade-level equivalency scores are being questioned as an appropriate means of interpreting the test performance of individuals and groups. They suggest further that "grade equivalents are not an equal-unit score scale . . . statistical computations based on grade-level equivalency values, are not, strictly speaking, legitimate (*Guidelines*, 1973). In some cases they admonish users not to report grade-level equivalencies at all.

What kinds of assessment information can a teacher — or a parent — derive from the results of a norm-referenced testing program? While scores are reported for each child who has taken a particular test, teachers need to be cautious about how the information is used. Three major problems exist. First, single test results never give exact assessments of an individual student's level of learning. They always contain a margin of error. If children are tested on more than one occasion, their scores can easily vary, often by twenty or thirty percentile points, in terms of national norms. Second, one must always consider whether children have actually been taught the material covered in the test they were given. Research on testing, not surprisingly, shows that students tend to do better on tests which are related to what they have been taught than on tests which cover material they have not been taught. The third point to be kept in mind is that all of the most commonly used standardized tests rely almost entirely on multiple-choice questions. This format is used because it is quick and easy to score. But it has limitations. With the multiple-choice format children need only pick out the correct answer to a problem from a set of answer choices. Just because particular children can recognize spelling errors on a standardized test, we cannot assume that they can write a correctly spelled letter. And children who read very well may select "wrong" answers from among the limited choices available for a host of reasons which may have little to do with their ability to read.

Recognizing these problems, teachers should interpret individual test results in relation to all of the other data which has been recorded about each child. It is for this reason that we began this paper with a discussion of informal assessment and record keeping. If a test corroborates other information about an individual child, teachers have additional direction for developing a responsive educational program for that particular child.

It is at the group level that the norm-referenced test data have greater potential. Much of the individual error tends to wash out at the group level. If the norm-referenced tests were well chosen at the outset — in other words, if they contain objectives closely related to the objectives of the teacher and the school — teachers can use the test results to assess strengths and weaknesses in their instructional programs. If, as a group, children score lower than the norm on problem-solving items, for example, teachers might reexamine their instructional programs in mathematics. Have they given sufficient attention to this area? If the average for mechanical skills related to reading is at the 80th percentile but the average for reading comprehension is at the 55th percentile, teachers might have a basis for examining their reading program. Are they giving too little attention to meaning? Are they providing children with a broad enough range of material to read? These are important questions.

Given some of the problems in deriving individual data from norm-referenced tests, increasing numbers of schools are beginning to rely upon *criterion-referenced tests*. In many cases, these tests are created at local levels and include questions developed to test locally identified learning objectives. Rather than being concerned about how a student's score (or a classroom's average score or school's average score) deviates from the norm, criterion-referenced tests focus on how far a student's score (or a classroom's average score or school's average score) deviates from a fixed standard. The standard (the criterion) is usually fixed at the local level. Teachers and parents might agree that children in the sixth grade should answer 70 percent of the questions relating to fractions correctly. Those who answer 70 percent or more of the items related to fractions correctly have met the standard. These tests provide teachers with additional information about *what* an individual can or cannot do. Because such tests are typically developed locally around objectives thought to be important, results on these tests are not only good vehicles for examining the local curriculum, but they are helpful in diagnosis. For example, a student who has not mastered addition of fractions but has mastered addition of whole numbers can be identified for specific instructional assistance in addition of fractions — the precise area of difficulty. The results on such tests can thus be linked directly to instructional activities.

While norm-referenced tests are almost entirely multiple-choice in format, criterion-referenced tests often take a different direction. They might set forth holistic tasks such as, "Demonstrate 3 ways of completing an electrical circuit" or "Write a letter of application, demonstrating knowledge of correct form." But, as with norm-referenced tests, teachers should be careful to use the results in consort with all the other information that has been recorded.

The School as a Whole

The foregoing discussion focused on individual teachers and classrooms and stressed careful record keeping. Testing was placed within the larger context of the ongoing documentation of children's basic skills learning. Teachers may draw upon this larger context of documentation for reporting confidently to parents, and for structuring what they do with individual children to enlarge their growth in the basic skills.

The school, as a whole, also needs to address some of the same evaluation issues. How teachers document children's learning in the basic skills, what kinds of records individual teachers maintain, what kinds of assessment activities are used, how teachers will report to individual parents about their children, and the school's overall objectives for basic skills learning should be outlined explicitly for the school community. The school can summarize a variety of classroom data for parents and community on an annual basis. For example, how many books, on the average, were read by children at various grade levels? What percentage of children at each of the grade levels mastered the learning objectives in mathematics, reading, and writing? What steps were taken with children who were having difficulty meeting the learning ob-

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jectives? How did parents respond to their children's experience in school generally and in the basic skills specifically? (This information might be derived from parent interviews.) What were the group results on criterion-referenced or norm-referenced testing programs?

While such information would be useful to the community, it can also be useful to the members of the school staff, providing a base for reexamining their collective efforts. If the staff members note areas where children tend to be having particular difficulty, they have a basis upon which to plan remedial action. By reviewing common data systematically, they can be assured that their judgments are rooted in an empirical base and are not based upon random observations.

Summary

In this brief paper we have attempted to place before readers a case for evaluation. We believe that evaluation is basic to the growth of programs, teachers, and children. While we offered some cautions regarding standardized tests, we also suggested ways in which they can be used constructively. Our larger concern, however, is to support systematic documentation that is integral to the instructional process. We recognize the burden that a careful documentation program related to the basic skills places upon teachers. However, we are convinced that the benefits are greater than the burdens. Teachers will grow in their professionalism through such a process, children will be better served because their needs will become manifest, and parents, who will begin to receive more specific information about their children, will have a more concrete basis upon which to share in their children's education.

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Planning and Management of Instruction

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Editors' Note: *Whatever the state or district plan for basic skills instruction, in the final analysis the teacher must make plans for the classroom. In this paper Pat Weiler provides general suggestions about how to plan and how to manage instruction. Emphasis is on parental involvement and regular evaluation (diagnosis) of student progress. While the Anderson paper focuses on moment-to-moment management of classroom interaction, Weiler focuses on decisions about what skills or content will be taught — when, how and to which students.*

The goal of the planning and management of instruction is the creation of child-centered programs that minimize unnecessary activities and confusion and maximize the productivity of all involved. This can be achieved in a resource room with a few students, in a special skills lab or a self-contained classroom, or by team teaching. Planning and management of classroom instruction are the cooperative responsibility of an instructional team of teachers, paraprofessionals, administrators, curriculum specialists, parents, and students (Glasser, 1979, p. 24). To emphasize the teacher's role as team and classroom manager, the term "teacher-executive" is used.

Teacher-executives plan organized systems for routine activities and guidelines for carrying out those tasks. These plans must be understood and agreed upon by both parents and students. The classroom's physical environment is organized to provide easy access to instructional resources. Curriculum design allows each student to succeed and become an independent learner (Brophy and Putnam, 1979, p. 191).

Recent teacher-effectiveness studies demonstrate the importance of precise basic skills curriculum planning. Objectives to be mastered by students are identified and made clear to both students and their parents. These can be objectives of the district basic skills curriculum or of an adaptation planned by the school curriculum committee. Regularly scheduled newsletters, progress reports, and, above all, daily homework assignments provide an important link in the communication chain. Teacher-executives realize that they must educate the family, not just the child.

Planning for Instruction

The best instruction planning results when there is input from all members of the instructional team and from curriculum materials. Students and parents can provide input by becoming actively involved in the planning process or by responding to surveys. At a minimum, teachers' impressions of student and parent concerns and interests should be assessed. Groups or individuals involved in planning are more likely to provide support later for the teacher and other classroom staff.

Because instructional team members are busy and the planning process is complicated, teachers and principals should take the primary responsibility for arranging the planning process. Successful planning efforts have included the following:

1. **Instructional Package.** A curriculum committee, representative of the instructional team, prepares an instructional package based on state, district, or school objectives. Components of the instructional package include basic skill expectations in mathematics and language arts for each grade level, entry and exit tests, resources and materials for instruction and reinforcement of the skills, and student profiles for recording and reporting to parents.
2. **Classroom Plans.** Before school begins in the fall, teachers and paraprofessionals meet in subject area groups or grade-level groups to prepare detailed classroom plans. Teacher members of the curriculum committee assist teachers in the use of the curriculum guides that have been prepared. Teachers have an opportunity to discuss individual programs with the principal and the curriculum specialist as well as with special education teachers and resource teachers who will be involved in the instruction of individual students.
3. **Diagnostic Process.** Before school starts, teachers will also plan a diagnostic process which they will use to assess instructional needs of their class as a whole and of individual students and to monitor students' progress. Planning for this process will include developing procedures for diagnosis and monitoring which are tailored to the instructional content and to the student population.
4. **Parental Involvement.** Parent representatives on the curriculum committee assist in informing other parents about the instructional program and involving them in the process. Presentations at school board meetings, special parent/teacher conferences, and individual after-school sessions provide the links necessary for success. When possible, daily opportunities for parental assistance can reinforce the instructional program. Programs such as "Dial-a-Teacher" (United Federation of Teachers) give parents and students access to immediate assistance after school and support classroom instruction.
5. **Planning Time.** Monitoring the instructional process, adapting strategies to meet individual needs, planning with support personnel (counselor, social worker, special education teacher), and coordinating programs with other teachers of the same subject area demand a great deal of time. A professional development program that provides for adequate released time for planning during the school day helps to ensure improved student achievement.

The instructional plan for each classroom will reflect the teaching style of the teacher-executive and the paraprofessional and the instructional needs of the students. Although most schools are still organized according to grade levels, curriculum committees and individual teachers must strive to develop continuous progress programs in which instruction progresses from each student's current level of development.

Management of Instruction

The instructional team must weigh all of the alternatives in designing a classroom management program. Management of instruction includes considerations of how decisions are made about the skills and content taught at any given time and how the classroom is arranged. This can include decisions about how students' level of development will be assessed; the collection and handling of information about student progress; how grouping will be used in the classroom, including the use of learning stations; the use of reading, writing, and mathematics laboratories; coordination between the classroom teachers and resource specialists in planning for the needs of special children; the use of incentives to motivate children; relating instruction to real-life situations; the use of media in the classroom and at home; and the role of parents in the implementation of the curriculum.

All instruction should provide the best opportunity for the student to learn at his or her own pace. Any or all of the above arrangements or approaches might be used, depending upon what is to be accomplished and upon student and teacher needs. Classroom arrangement choices for just one day might include total class instruction, small group interaction, instructional centers, and individualized instruction. The choices of approach to what is taught and when can fall anywhere on a continuum from highly organized to informal.

A continuous-progress curriculum has student-focused instruction as a primary objective. The diagnostic-prescriptive approach — a highly organized approach that usually focuses on individual skills — can assist the teacher and paraprofessional in planning instruction designed to meet the needs of all their students. Its basic elements can be seen in most instruction and can be used in managing a subskills-oriented instructional program as well as a holistic program. The use of a diagnostic-prescriptive approach assumes the existence of a plan with specific objectives and means of assessing their achievement.

Student information should be relevant and kept up to date. Skill mastery can be recorded on individual profile forms in student folders or on wall charts in the classroom, visible to all students. Skill inventories based on classroom instruction and on criterion-referenced tests are designed to determine skill strengths as well as deficits and can be constructed so as to identify progress on clusters of skills.

Students can be grouped for instruction according to their skill level as determined by the inventory. Paraprofessionals, as members of the educational team, can provide individual and small group instruction to students to assist them in deficit areas as well as to reinforce skills they have mastered. Planning for this support is facilitated by a variety of instructional materials that ensure mastery of these skills.

When diagnostic instruments show lack of progress or regression, it may be important to assign the student to a reading or mathematics lab (see Office of Education, 1979, pp. 9-23, 29-37). If the lab is set up within the school, classroom teachers and lab teachers can plan together to gear the lab instruction to mastery of skills necessary for the student to continue to achieve in the classroom. Less difficult enabling skills may be the necessary link for continued academic growth of the student. Increased instruction from the teacher may benefit the student significantly. Reinforcement through home activities can also facilitate skill mastery.

If the regular classroom is viewed as the least restrictive environment for handicapped children, the special education teacher and the regular classroom teacher must plan together to provide an effective instructional program for those children. The skills program identified in the Individualized Education Program (IEP), a plan developed for each special education student, focuses on coordination between the regular classroom teacher and the resource specialists and materials available to the teacher (resources for classroom teachers are available from the American Federation of Teachers, Washington, D.C.).

Although most schools are still organized according to grade levels, curriculum committees and individual teachers must strive to develop continuous progress programs in which instruction progresses from each student's current level of development.

Classroom programs can provide many opportunities for students to reinforce skills through small group or independent activities. Learning stations can be set up to help students practice skills or learn independently (Forte and Mackenzie, 1972). Individual student learning styles are identified and kept in an individual student profile. Knowledge about learning styles and students' learning pace can guide the teacher in planning small group and independent activities.

Incentives for continued achievement are important and differ according to students' levels of development and personal interests. Some teachers have successfully used tokens as incentives. The child accumulates and trades them for prizes or free time (Engelmann, 1969). Other teachers develop contracts with students, in which the students agree to master skills in a given period of time, depending on their learning pace. The reward may be the completion of the contract and the teacher's signature to mark the event. Positions of responsibility within the classroom may provide incentive for some students. Other students may enjoy being named as checkers, with the responsibility of checking other students' work, and some may assist in peer tutoring (Kaplan et al., 1975).

Motivation for learning is closely tied to recent concern regarding competencies necessary to participate fully in society. Students must be taught reading and mathematics skills in the context of everyday life situations. "The curriculum must be viewed as a reflection of life, not a compartmentalized distillation of a publisher's dream" (Lorio, 1978, p. 18). Relevance is a key factor to be considered by teacher-executives. Field trips and parent-child activities reinforce the instructional program begun in the classroom. Daily instruction should relate to local, national, and world events. Familiar objects used in everyday situations should be brought into the classroom when space and budget permit.

A growing number of teachers and parents find that television can be used as a tool for learning. Teachers prepare students for home television viewing by providing background information and by providing the connection between television programs and resources available in the classroom or the school library. ("TV Notebook and Study Guide" is published monthly in AFT's *American Educator*.) Parents can also support learning at home through

Instructional Management Checklist

> *A successful (reading) program is not a static one. It is in a continuous state of change, growth, development and refinement. Maybe in the light of this there are no successful instructional (reading) programs, only programs in a continuous quest for success.*
>
> — Shirley Jackson

________ Organize the classroom for efficient use of resources

________ Use diagnostic instruments to place individual students on an instructional level where they will succeed

________ Use prescriptive activities that take the learning style of the individual student into consideration

________ Group students for instruction; those who have like needs can be grouped together for seminars

________ Use a variety of learning experiences to reinforce skills that have already been mastered

________ Involve students in the responsibility for classroom management (personal record keeping, checking papers, etc.)

________ Use all the resources available to students in the school (counseling and social service support personnel, reading lab, math lab, science, etc.)

________ Reward decision making and independence through positive reinforcement

________ Monitor evaluations (tests) closely and incorporate strategies for developing clusters of skills

________ Involve students in planning classroom activities, tasks and centers

________ Include parents and significant others in planning and evaluation games and other activities presently being developed by federally funded projects that use television as a means for increasing individual students' skills in the basics of reading, writing, critical thinking, and mathematics (for example, Southwest Educational Development Laboratory, Austin, Texas — grades K-5; WNET/Education Department, New York State — grades K and 6-8; and the Far West Laboratory for Educational Research and Development, San Francisco — grades 9-12).

Parents can make a most significant contribution to continuity of instruction by ensuring that children attend school regularly and arrive on time. Parents must be informed of student progress and curriculum development regularly throughout the school year. Continued support through reinforcement of skill mastery in the home and community make a difference in the student's academic performance (Snow, 1976, p. 49). "Home paks," with guides to activities developed by teachers and parents at school-community workshops, help parents reinforce classroom instruction (Rich, 1978). Parent and child can participate together in using familiar objects in the home and community.

The Administrative Role

Administrative support provides for continuity in schoolwide management procedures and curriculum, ensures that necessary resources are available, and encourages home-school relations. When principals, teachers, and parents cooperatively plan, the principal effectively assists teachers as they create an exciting learning environment. Although effective principals are not often acclaimed when teachers have adequate supplies and classroom resources and when there is continuity in the curriculum, these factors do contribute to improved student achievement, and administrators should be applauded for fulfilling their responsibility.

Inservice Education

A long-range inservice plan is an integral part of a successful curriculum program. Districts may consider establishing a teacher center or similar ongoing staff development program, set up so that teachers, administrators, school board members, and university faculty can collaborate in the development of an inservice program. Such a program can give teachers, who are often isolated by individual school structures, a chance to work cooperatively with other teachers and paraprofessionals to develop new skills and to explore new and different areas of specialization to assist them in assessing the changing needs of students and designing relevant instructional programs and materials.

Conclusion

Programs which are trying to create a child-centered environment and a curriculum which will meet the needs of students at all levels of achievement — often using a diagnostic-prescriptive approach — exist in thousands of school districts across the country. But much more needs to be done. Every basic skills program can be exemplary and can ensure continued student growth and achievement if emphasis is placed on planning for local needs and effective management of the instructional process.

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Issues in Basic Skills Planning

Overview: *The first two papers in this section provide a map to help guide the reader in basic skills planning. As with a highway map, these two papers provide only general direction and identification of major landmarks. The reader will need to consult other papers for details and may need to seek assistance from persons familiar with the planning process. The first of these, by Michael Kamil, emphasizes questions to consider in planning — questions which will help to identify important decisions to be made. Gerald Duffy's paper suggests more specific steps in planning. In the third paper Charles Allen reports on one school district's experience in planning a minimal competency program and describes some potential challenges and pitfalls in such planning. The last three papers discuss broad and fundamental factors to be considered in basic skills planning. Jay Samuels reviews research on factors found in effective schools and makes specific recommendations about what a program must include to assure its effectiveness. William Gorth and Marcy Perkins summarize the approaches that five states have used in defining and developing basic skills competencies within their competency testing programs. In the final paper, John Bormuth reviews and critiques evidence on levels of literacy. He finds that levels of literacy in the population as a whole are rising. Although agreeing with the need for more attention to literacy instruction, he cautions that planning in a panic may lead to weakening, rather than strengthening, instruction.*

Making Choices in Basic Skills Instruction: Research and Theory

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Editors' Note: *In this paper Michael Kamil has drawn from the other papers, the synthesis meeting, and his own research on models of reading to outline questions and ideas to be considered in reviewing and planning basic skills programs. He discusses the role of educational theory and research in basic skills planning and suggests a theory of instruction which serves as a basis for seven questions. Kamil suggests that these questions should help to focus and organize issues to be considered in the planning process. As we prepared the summary and analysis of these papers, the seven questions also helped to determine the dimensions used for describing different approaches to basic skills instruction.*

There are no simple answers regarding the content and approaches to basic skills instruction. Like so many contemporary problems, the issues involving basic skills instruction are not only complex but are also based in deep-rooted beliefs about how the world ought to be and what the schools ought to be doing with children. At bottom, however, is a truly basic question: What, after all, are the basic skills?

On the one hand, the notion still persists that the basics are the traditional 3 Rs — reading, writing, and arithmetic. On the other hand, there is an ever-growing group of futurists who warn that the years to come will demand other "basics" — that reading, writing, and arithmetic will not be nearly enough. Similarly, some blame basic skill deficiencies on a lack of emphasis on phonics and computation, while others point to an ever-increasing body of research and experience which indicates that much more than phonics and computation are involved. And, while some place great emphasis on controlled, efficient, and specific instructional strategies for promoting greater basic skills learning in our children, others argue for a strong commitment to preserving the spontaneous childhood exploration emphasized in less constrained learning environments.

With the many choices and the lack of clear answers, we might hope to avoid making any decision. However, this is one choice individual school districts do not have. They must specify the nature of the basic skills when they plan instructional programs and, now, when they apply for Title II funds.

This paper and the next, written by Gerald Duffy, are designed to help program planners make choices about basic skills instruction — what to teach and how to teach it. This paper examines the contributions of research and theory. The Duffy paper examines the values and practical constraints which operate on the planners (and the school) to further shape the choices to be made about basic skills instruction.

To illustrate the stages of decision making, we have pictured the process of making basic skills choices as a funnel (Figure 1). The funnel shows graphically how the clarity and rationality of a basic skills program increases as choices are made. Beginning with a large number of vaguely understood and apparently unrelated options, these two papers suggest ways that the confusion, uncertainty, and potential conflicts can be reduced, narrowing the field of choices. The program which results from such a rational decision-making process takes into account the wide variations in student needs, as well as parental and professional values, and yet is understandable, viable, and coherent.

When planning a basic skills program, we can start either with the four basic skills areas specified in the federal Title II legislation (reading, mathematics, written communication, and oral communication), or we can begin with a broader assessment of what students need to learn. If we opt for the second choice, we must then determine how instruction in the basic skills can contribute to outcomes relevant to such student needs.

We believe it is preferable to begin with the broader assessment. An initial planning focus which considers only the four basic skills may lead to plans which do not match those of the community or the school, and which do not fit into the remainder of the school curriculum.

The Duffy paper and this one plunge directly into the middle of the basic skills planning process. It is assumed that a survey procedure like that presented in the Stump and Selz paper has already been completed. In situations where no survey has been made, the planning process for the basic skills program should begin with the identification and analysis of the basic skills components of the existing curriculum and a study of various factors within the community which should influence the planning process. A review of these factors will help in the determination of what, if any, changes should be made to best meet the needs of the community and its children.

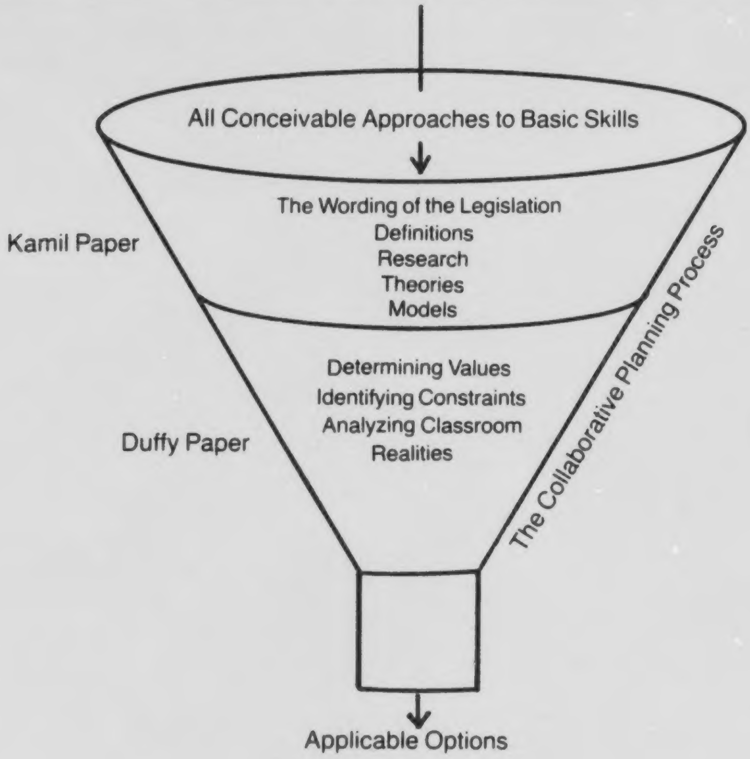
All Conceivable Approaches to Basic Skills
The Wording of the Legislation
Definitions
Research
Theories
Models
Kamil Paper
Determining Values
Identifying Constraints
Analyzing Classroom Realities
Duffy Paper
The Collaborative Planning Process
Applicable Options

Figure 1. The Process of Making Basic Skills Choices

The first ingredient in developing a program which meets the needs of the community is a collaborative planning group, whose task it is to identify, examine, and bring to resolution the conflicts between the values and constraints which govern curricular decisions in the school district. Such a group should include teachers, content specialists, central office personnel, board of education members, parents, and — particularly in the cases of adolescents — students.

The collaborative planning group must perform four analytical tasks. It must (1) examine the values of those involved, since these values will become the foundation for curricular principles; (2) examine the current instructional program; (3) examine the constraints operating on the school system which determine what the curriculum can and cannot be; and (4) determine what can reasonably be expected of classroom teachers. The results of these deliberations by the collaborative planning group are then used in developing a basic skills program for the district. In short, an effective basic skills program must be built upon a careful analysis of what is and what is not appropriate and possible for a particular district. A collaborative planning group charged with assessing the district's position can provide planners with the framework needed to create an appropriate basic skills program. The functioning of such a group is described more fully by Duffy.

Before such a planning group can accomplish its four tasks, the members need some framework for organizing their ideas about instruction. This instructional framework should include working definitions, theoretical bases, and instructional models. In this paper, we will attempt to provide some possible definitions, theories, and models. However, it is first necessary to take up the place of educational research as a basis for informing instructional choices.

The Role of Educational Research in Basic Skills Planning

For planning groups trying to choose among basic skills options, a review of the relevant research literature often proves frustrating. A not uncommon expectation is that there will be a "best" method, or group of methods. The sheer volume of seemingly contradictory results often leads practitioners to reject the research literature as even a partial solution to their difficulties in selecting methods of instruction. While it is true that some research findings can be difficult to interpret, there are others that are unambiguous. A few examples: The more individuals practice the better they will be (or become). Or, motivation is necessary for learning. Or, meaningful material is learned better than non-meaningful material. While these results, taken in isolation, are unambiguous, they are not unrelated. Practice appears to lead to greater competence, but if the student is motivated and the material is meaningful, the practice is more effective. Such interrelatedness gives some idea of the complexity of instructional research.

In attempting to weigh and interpret the results of instructional research, planning groups should bear in mind the following limitations of such research.

First, research on instruction is often conducted after the model of the natural sciences in laboratory conditions. It is difficult to bring appropriate populations, teachers, and settings into the laboratory. The recent concern over "ecological validity" (the question of a study's validity or appropriateness in the situation to which the results will be applied) is a reflection of this situation. It would appear easier to derive specific direction for instruction from educational research that is conducted in actual classrooms. Laboratory studies present difficulties when the results are transferred, without additional verification, to the school setting. Similarly, research studies in reading using nonsense syllables or single words are difficult to translate into educational practice.

Scientists have been reluctant to do research outside the laboratory because of the problems they encounter in controlling all of the variables. The use of computers may make it technologically possible to measure, if not control, extremely large numbers of these factors. If this becomes true, studies will come closer to ecological validity (Bronfenbrenner, 1976).

Second, practitioners often look to researchers with the expectation that they will develop entirely new and different techniques that will be "the answer." At best, researchers can only hope to verify the efficacy of existing techniques, rejecting those of little value. As research methods become more attuned to ecological validity, the testing of methods will become more precise. Researchers will know *why* specific methods do or do not, should or should not, work.

Third, many research results appear contradictory because different researchers are dealing with different variations of the same problem. Replication studies (studies performed more than once by different researchers) can provide greater certainty about the findings, but unfortunately, few examples of such replications are presently available.

Fourth, the differences in performance should be instructionally important as well as statistically significant. For example, many studies of word recognition find statistically significant differences that are of the order of milliseconds. Such differences do not represent any usable (or even noticeable) differences for the classroom teacher. On the other hand, instructional methods very different in appearance often do not produce statistically significant differences in achievement.

It is not the purpose of this paper to review all the research on learning and teaching. Planners who need help with this task will find that several good integrative reviews are available. Those listed in the reference section offer information about specific instructional questions.

Planners should be advised that the direct instructional guidance available from research is limited by the relative lack of research that is ecologically valid, replicated, and conducted on appropriate populations, and which shows instructionally important differences. Aside from the cautions derived from these considerations, there is a useful rule of thumb: Research is to be believed or trusted if there are few (or no) contradictory studies, or if there is general agreement about the findings among respected researchers and practitioners.

There is reason to hope that we will eventually be able to find the answers we need from research. For the moment, however, curriculum planners may use these rough guidelines to select from the mass of research findings and data which are available.

How Can Definitions Help?

Definitions are at the root of the basic skills controversy. One person's definition of reading or mathematics dictates what that person's "basics" will be. Someone who defines reading or mathematics differently will specify different basics. However, definitions also provide a potential solution to some of the basic skills problems. By carefully examining the definitions which distinguish the basic skills alternatives, we can clarify the issues and build a foundation upon which to make choices. In short, the basic skills controversy becomes somewhat less messy if we can make some sense out of the definitional issues.

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Let's approach the definitional task by looking at the terms *basics* and *skills*. In our discussion we will consider a skill as a set of behaviors and knowledge which can be applied to a specific situation — either to understand or to change the situation. The presence of a skill or skills is shown by a demonstrated ability to perform an intellectual or physical task. It is assumed that skills can be learned, forgotten, and re-learned. It is also assumed that a person may possess a particular skill, but distractions, anxiety, or confused direction may interfere with the demonstration of that particular skill in a given situation.

There is no great controversy over the term *skills*, but when we consider the term *basic*, we are confronted with a paradox: everyone seems to believe that basic skills are an essential part of the educational endeavor, but there is intense controversy over what *basic* means.

Much of the difficulty with the definition of *basic* arises because people have different sources for their definitions. The dictionary uses such terms as *fundamental* and *essential* in defining *basic*. For most people, basic skills include the skills which are essential for functioning in society and for learning other skills. The controversy continues when we try to determine what is and isn't essential.

The federal Title II legislation includes the familiar reading, writing, and arithmetic as basic skills, and adds oral communication. Planners would be well advised to work through to a consensus on defining basic skills. This is an important preliminary step and should be taken before planners take up the consideration of the role of theories and models in narrowing instructional choices.

How Can Choices Be Informed by Theory?

Educational research is the enterprise of discovering what variables in a situation influence desired outcomes. Although research cannot guarantee answers about basic skills instruction, it often suggests the kinds of questions that should be asked.

One of the goals of research is to create theories which will identify what is important in a situation and suggest ways to change a situation for the better. Theories in education do not have the same validity, formality, or rigor as those in the physical sciences. Often, our present understanding is not sufficient to provide a theoretical model of an educational process. Reading provides a good example of this difficulty. The closest we have come to a theoretical conception of reading is that the reader translates print from a text into meaning (comprehension). We do not know whether the reader's comprehension processes begin with the text and move through the senses to the mind, or whether they begin in the mind and proceed toward the printed symbols.

Because there is no firm, unequivocal evidence about the nature of the reading process, different theories have been formulated to represent, identify, and order the component processes that researchers believe are vital to reading. These theories are best taken as informal guides to thinking about reading, rather than as scientifically proven statements. This qualifies, but does not negate, their usefulness in instruction, for informal theories can often be very useful for the purpose of making choices and decisions.

Models determine and define the teaching/learning process, even when teachers are not consciously aware of acting on the basis of such models. Every teacher operates with at least an implicit model of reading. The decisions teachers make are a function of their beliefs about reading. However, research has also indicated that teachers' decisions are not solely the result of translating these implicit models directly into practice. Rather, the implicit models teachers act upon are modified by a number of external classroom conditions. Among these are individual student characteristics (general ability, for example), the materials available, and the need for efficient classroom management. Formal, explicit theories of reading typically do not deal with such environmental variables.

This paper will not consider specific research data, but will examine some tentative instructional theories in order to arrive at questions which should be asked in curriculum planning. We will first consider a theory which provides an outline of the major aspects of instruction. We will then suggest the types of questions which can be derived from that theory.

Taken together, the following three statements define and delimit the instructional process. They will represent our general theory of instruction.

1. Learning results in changes in how an individual understands the world or changes in the individual's behavior.
2. Instruction is arranging the environment so that learning can occur. It is influenced by interactions among the beliefs and skills of parents, teachers, students, and others.
3. Performance is applying learning to a given situation.

The following questions, derived from the three basic theoretical statements above, should be asked by planners before decisions are made about basic skills instruction. The answers will shape the program, including materials, management systems, and instruction. Staff development also will ultimately depend on the answers to these questions.

These questions are derived from the first theoretical statement:

What are the units of learning? Since learning results in changes in knowledge, decisions about instruction must deal with these basic units. The tradition of cognitive psychology provides a long list of possible units, including schemata, lists, networks of associations, or processes. Educators have suggested skills or facts as basic units.

What should be the content of instruction? Each content area is defined by a model that specifies the components to be learned. It also specifies the arrangement of the components (as a hierarchy or as a sequence, for example).

These questions are derived from the second theoretical statement:

What should the format of instruction be? Among specific issues suggested by the second statement are questions about whether learning should be inductive or deductive, the amount of practice and repetition necessary, and the types of motivation and reinforcement thought appropriate. Some of these questions may be dictated by external concerns — for example, the types of materials available.

When should instruction be given? Two issues are important here — developmental appropriateness and sequencing of subject matter. Instruction should not be given until children have reached the level of cognitive development which enables them to learn the subject matter. Sequencing will ultimately be determined by the content.

What is the role of individual differences in instruction? Should instruction be individualized or should it be conducted in groups? Learning rate, learning style, and disabilities are all pertinent to this issue.

What is the role of social dynamics in instruction? Important here are questions of effect, teaching styles, and interpersonal relations. Classroom environment can strongly influence instruction.

This question is derived from the third theoretical statement:

How should learning be evaluated? The third statement suggests that performance defines evaluation. Tests and management systems should be chosen with this in mind.

Three Models of Instruction

The present curricular controversy appears to be between an instructional model with a focus on skills in isolation, and a model with a focus on the meaning and context of skills. We will refer to the first model as *subskills* and the second as *holistic*. Although there are advocates for the pure forms of these instructional models, the common practice is to use a modified approach. For the sake of our discussion, we will speak of this approach as a "balanced" model. This third model is not just a mixture or "average" of the other two. It adds an element of the interaction between the other two models. We will take up each model in order to distinguish the nature of the assumptions about performance, learning, and instruction peculiar to each.

The conflict over basic skills instruction is a reflection of the very different models of performance, learning, and instruction which people have in their heads. In most cases these models are not clear to those involved in the controversy. It is our belief that it will be far easier to resolve the controversial questions in program planning if all of those involved are fully aware of the theoretical bases for their positions.

Although planners must make choices, our emphasis here is not on choosing one of the three perspectives, but on raising the awareness of what it means to base a decision on one of these three prevalent models. We are not, therefore, concerned so much with advocating a single "best" perspective as with presenting the widest range of possibilities. It is hoped that this paper will help delineate important issues and goals in basic skills instruction. As a result of the discussion of models here, a school may decide either to modify its existing programs or to implement new ones. The discussion here and under the subsequent section will highlight distinctions among what we are calling *holistic*, *subskills*, and *balanced models*.

In the subskills model, the primary emphasis is on the child's learning individual skills through direct instruction on and extended experience with each skill in isolation. The expectation is that the use of those skills to convey and receive meaning and solve problems will be mastered subsequently.

In the holistic model, the child is believed to learn through experiences involving conveying meaning or solving problems. The expectation is that the individual skills will be mastered in the process, without removing them from context.

There are several characteristics of these models that can be used to classify them. First, they can be identified by their initiating focus — the assumptions they make about the nature of learning and instruction. Holistic models assume that the content of instruction is not separable into component skills for teaching or learning. These models generally assume that when skills are taught or used in isolation, they are qualitatively different from what they are when used in a whole-situation context. For example, a holistic model of reading assumes that the initiating focus is on meaning. It also assumes that readers "predict" meaning and use the text only to verify the predicted meaning.

The conflict over basic skills instruction is a reflection of the very different models of performance, learning, and instruction which people have in their heads. In most cases these models are not clear to those involved in the controversy.

A subskills model, on the other hand, assumes that the initiating focus of learning is on the individual components of the process. By learning each of the component skills, the child can learn the entire process. In reading, such a model assumes that the student learns letters, proceeds to words, phrases, sentences, and so on. By combining all of the component skills, the student arrives at the meaning of the text. Almost all programs which emphasize *mastery learning* contain some subskills assumptions. Those programs which involve *skills management systems* clearly have such assumptions. (In reading, these are often referred to as code-emphasis.)

The third type of model is called a *balanced model*. Here, learning and instruction are believed to be initiated both holistically and from a subskills perspective. The two processes are assumed to be mutually facilitating. The holistic prediction of meaning helps to make the identification of component parts (by use of the subskills) easier. At the same time, the identification of some of the component elements facilitates the prediction of meaning.

Learning does not occur without some knowledge of the correctness of responses. Every model contains some assumptions about what are acceptable responses in specific situations. In mathematics, for example, a holistic approach might provide positive feedback if the student obtains the incorrect answer by an appropriate method. A subskills model might only give positive feedback for each correct step in the process, so that positive feedback occurs only when the answer is correct.

Using Models to Make Instructional Choices

The questions about instruction discussed previously were derived from our original three theoretical assumptions about instruction. We then added the context of three models of instruction — holistic, subskills, and balanced. In this section we will place the instructional question in the model context. We find that the particular model used will determine the answers to the instructional questions. The use of such a procedure will help planners in the task of specifying programs consistent with a particular approach. Where appropriate, two levels of instruction will be considered. At one level will be the individual skill areas; at the other will be the entire curriculum. Answers will differ according to the level; for example, answers provided for reading will be more specific than those provided for the curriculum as a whole. It is important to obtain an answer to every question, even though such answers may not always be readily apparent.

It is necessary here to inject a word of caution. In most of the model comparisons discussed here, we noted that the balanced model combined aspects of the holistic and subskills models. This does not mean that the balanced model is automatically the "best." If a school is strongly committed to either the holistic or the subskills model, the eclecticism inherent in the balanced model can be inefficient or detrimental. With this caution in mind, let us turn to the instructional questions we identified earlier:

What are the units of learning? For subskills models, learning is related to relatively small units, which are then arranged to produce larger units of learning. Holistic models typically specify larger units of learning, more directly related to one another. Balanced models often do not specify the units, but they are typically combinations of the two types. (This same analysis is true at the content level as well as at the curriculum level.)

What should the content of instruction be? In basic skills, some of the content is predetermined by the definitions. For the entire curriculum, holistic models suggest that the various skill areas be related to one another. Subskills models indicate that each area could be taught separately. Balanced models provide some mix of separation and integration.

What should the format of instruction be? Here again, there are differences among the classes of models. Subskills models often stress drill, practice, and repetition. Motivation and reinforcement are often seen as external to the child. Holistic models place much less emphasis (or none) on learning in the context of drill and repetition. These models view motivation and reinforcement as necessarily intrinsic. Balanced models view instruction as a combination of these factors. For the entire curriculum, the formats suggested by each model would be the same as they are for separate areas of the curriculum.

When should instruction be given? The answer given by most holistic models to this question is, when the child is ready. Specific components are not stressed, so there is usually little or no emphasis on the sequence of instruction. Subskills models usually, but not always, have highly structured sequences of instruction. Developmental appropriateness is also, of course, important in subskills models. Balanced models stress giving both subskills and holistic instruction interactively from the beginning.

How should instruction be evaluated? Evaluation procedures are dictated by the answers to all of the previous questions. Holistic instruction, for example, cannot be fairly evaluated by skills management tests. Nor can subskills instruction be fairly evaluated by holistic instruments. There are no unique evaluation techniques for balanced models. Rather, a combination of evaluations appropriate for holistic and subskills approaches is dictated. It is obvious here that a consistent match must exist between instruction and evaluation. If the match does not exist, instruction and evaluation are both doomed to be ineffective.

What is the role of individual differences in instruction? Holistic models stress individuality and respect for individual differences. The child is actively involved in decision making for instruction. While the subskills model can also stress individuality, the decision-making procedure is not typically under the student's control. However, progress is expected to vary in rate from student to student. Balanced models again combine aspects of both.

Consistency

It is vitally important, particularly in dealing with complex programs, for the planners to be consistent. Three types of consistency can be identified. First, teachers, planners, and administrators must have consistent expectations about instructional programs. That is, all of those who will plan and implement a new program should use the same criteria in evaluating the results of the program. If expectations are different, the same results will be judged differently. This consistency of expectations is a hedge against needless programmatic changes.

A second type of consistency is that of underlying theories. There must not be conflicts or incompatibility between the general theories on which instruction is to be based, or between the general theories and the instructional models. For example, if the model of learning is holistic, but the underlying theory is that instruction should be directed to development of individual skills, difficulties will arise. A program must be based on consistent principles if it is to be successful. It is a prime function of the planner to ensure that the principles underlying a program are consistent.

Finally, there must be consistency between instructional goals and methods of evaluation. This sounds trivial, but, in fact, it is not. A program based on holistic teaching should not be evaluated from a subskills point of view. The teaching materials themselves should have appropriate evaluation instruments. The reverse is also true: evaluation materials determine what teaching materials are appropriate.

Conclusion

In this paper, we have seen how program planners can use definitions, theories, models, and research findings to shape decisions on instructional programs. In the Duffy paper, some of the more practical values and constraints affecting choices among options will be discussed.

After reading through the papers in this volume, particularly those describing the instructional options, program planners may be moved to ask whether *any* combination of these options can be used? The answer (unfortunately) is "yes and no." While it is possible to select any combination of these options, it may not be either advisable or desirable to do so. The most important considerations are that the options chosen must not conflict with each other, with instructional goals, with the available materials, or with teacher orientations and competencies.

Recent work by Duffy and his colleagues (Duffy and Metheny, 1979) suggests that teachers base their instructional decisions on some or all of these factors. Planners must take particular care to involve all levels of instructional personnel in all planning stages of a proposal, for a successful program must take into account the fact that instructional decisions are necessarily made in the light of the reality of the classroom situation. Staff development, materials acquisition, and classroom management are integral components of decisions, as surely as are research findings and theories and models of the instructional process.

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Making Basic Skills Choices: Values and Constraints

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Editors' Note: *In this paper Gerald Duffy has turned to the other papers and the synthesis meeting discussions to provide general suggestions on steps to take in the reviewing and planning of basic skills programs. Duffy proposes the use of a collaborative planning group and suggests that the planning group must determine community values, analyze constraints, consider the teacher's situation, and examine how all three interact and influence a basic skills program.*

Ideally, the program planning process includes an analysis and assessment of the existing school program and a comparison of that program with school and community expectations. Actual program planning tends either to be overly determined by existing programs or to be done almost in isolation of existing programs. We hope that some of the ideas presented in these papers will facilitate the review and assessment of existing programs and a similar review of school and community needs. The entire collection of papers is intended to make available the outcomes of research to help guide the review, assessment, and, where appropriate, redirection of programs.

All planning should take place within the context of a collaborative planning group, which should be made up of respected and openly identified representatives of the various groups which have a stake in the instructional process and its outcomes. This paper will describe some of the issues that such a group must consider and how research might contribute to the planning process. Although the emphasis here is on collaboration and the involvement of representatives from many groups in planning, it should be noted that the writing of a plan is often best done by one or two people. The writing itself should be based on the work of the planning group and an ongoing review from that group.

Role of a Collaborative Planning Group

A first step in planning should be the establishment of the collaborative planning group, which should include school personnel from all levels and, if possible, parents. This group should meet on a regular basis (1) to assess the local district's position with respect to subject matter, the learner, the teacher, and the learning environment; (2) to identify those constraints which society, special interest groups, and school managers place upon curricular programs — constraints which restrict the school district's options; and (3) to identify the realities of the classroom which affect the implementation of any program. This planning group, in effect, regularly "takes the pulse" of the local school district, clarifying and modifying those educational principles which form the cornerstone of the district's curriculum. The existence of the planning group helps to ensure that the best ideas of various groups are contributed to the planning process.

Tasks of the Planning Group: Determining Values

Making choices among the basic skills is a value-laden process. The problem is not so much whether particular models have been established by empirical inquiry to be "best," but, rather, what the group believes concerning what the basic skills ought to be and what impact schools should have on children. To choose among these options, the school district's collaborative planning group must first identify what it values about school and schooling. These values then form a basis for the principles upon which the basic skills programs will be built.

The holistic/subskills debate described in the Kamil paper is a good example of the complexity that can be involved in making value choices. Each side has its particular views about what should happen in basic skills programs. For instance, the supporters of holistic instruction value learning situations in which language and mathematics develop naturally, in which children spend their time on activities which have intrinsic interest and meaning, and in which teachers allow children to achieve their individual potential as learners. It is their hope that the holistic approach to basic skills will enhance the understanding of the language and mathematics processes which they believe children already possess intuitively if they are but allowed to display it. Further, they hope that by emphasizing real-life contexts, children will not only be more proficient in the skills themselves but will have a realistic grasp of the role of these skills in their lives and a vision of the rewards which result from using these skills.

Supporters of the holistic approach fear that the values children develop from holistic instruction will be lost if instruction is fragmented. In such an environment, they believe, the language and mathematics processes would be isolated into useless pieces of knowledge, the natural curiosity of children would be squelched, emphasis on minimal competencies would overshadow the creative use of language and mathematics, low-level skills would be given preference over higher-level, problem-solving skills, low-ability students would be favored over the gifted, artificial testing devices would force teachers to "teach to the test" rather than emphasize the process, and the professional initiative of teachers would be stifled because they would have to become "technicians" rather than "facilitators."

Advocates of the subskills approach to instruction value different things. They view their approach as one which sharpens the focus of instruction, which implements carefully conceived skill sequences, which breaks learning down into manageable steps, and which guarantees each child systematic assistance in learning the basic skills. They value the skills approach to basic skills instruction because they believe it provides both teachers and children with a detailed "road map" for teaching and learning language and mathematics processes, because it yields scientific diagnostic data which serve as an "early warning system" when a child is not making satisfactory progress, and because it narrows the achievement range in the learning of basic skills. Further, they fear that these values will be lost if the holistic view is adopted. For instance, they fear that a holistic approach to basic skills instruction ignores the child who does not learn "naturally," that children are expected to perform complex tasks when they don't know how, that it encourages poor teachers to create an "anything goes" environment, that lazy teachers can avoid the responsibility for teaching by saying that they are "facilitating," that the excessive flexibility associated with holistic approaches leads to inefficient use of instructional time, that the approach does not lend itself to the current demands from society regarding competency testing and other forms of accountability, and that the teacher's role as an instructor is ignored.

It is obvious that what is valued about basic skills by one group is not necessarily valued by another. Consequently, a school system proposing a basic skills program must first identify what it believes the basic skills program ought to include and what form it ought to take in the classroom.

It is obvious that what is valued about basic skills by one group is not necessarily valued by another. Consequently, a school system proposing a basic skills program must first identify what it believes the basic skills program ought to include and what form it ought to take in the classroom. Determining the values held by all of the relevant groups in the community served by the school district is not easy, since it is unrealistic to expect consensus on value-laden issues. However, rational processes for arriving at a determination are available.

Basically, the process recommended here is one of self-examination — a process in which the collaborative planning group asks itself a series of questions about the basic skills subject matter, the learner who receives basic skills instruction, the teacher who provides the instruction, and the environment within which the instruction takes place. In essence, the planning group uses these categories as a framework for deciding what the basic skills program ought to be. The framework for the questions to be posed is based on the four categories discussed by Schwab (1978). These particular categories are not the only ones that can be used to identify the basic skills values of a particular school district. For instance, the questions about instruction which are posed in the Kamil paper could be adapted for the same purpose.

While there is no attempt to supply an exhaustive list of questions here, the following are illustrative of the kinds of questions that can yield insight regarding what a particular community values about basic skills:

Subject Matter

1. What are the units of basic skills instruction? Should the focus be on isolated units or on larger language units?
2. What are the goals of basic skills instruction? Should the goal be skill acquisition or the creative application of skills?
3. How specific should the basic skills objectives be? Should we emphasize behaviorally stated objectives or more global statements?
4. Should the basic skills be treated as a whole, broken into component parts, or combined in some logical manner?
5. Should the basic skills be thought of separately, as part of an integrated whole, or both?

The Learner

1. Should learners be actively involved in using the skills in real situations, should they master the skills in isolation, or should they do both?
2. Do children learn to read naturally or do they need to be taught?
3. Are children basically self-motivating, do they need some form of external motivation, or does the moment determine the type of motivation?
4. Should children be allowed to explore, should they be provided with structure and routine, or should there be some kind of combination?
5. Should children's personal development take priority over their skill development?

The Teacher

1. Should teachers directly intervene with children to teach basic skills, should they be facilitators who bring children together with situations in which they can meaningfully use their skills, or should they do each at appropriate times?
2. Should teachers follow a structured curriculum sequence, or should they develop a more "open" environment which emphasizes whole-language activities?
3. Should instruction in basic skills be integrated into real-life contexts, or should instruction be confined to textbook and classroom activities?
4. Should the basic skills become automatic responses which children produce instantly, or should they be thought of as reflective processes?
5. How should basic skills instruction be evaluated?

The Environment

1. Should the classroom reflect real-life situations, should it be a place where academic learning is emphasized, or should it be some combination of these?

2. What are the needs and unique characteristics of the children?
3. What expectations should we set for our children? Should children be viewed as individuals having unique developmental patterns, or should they be expected to maintain "average" growth patterns in the basic skills?

There are no right answers to these questions — the collaborative planning group must decide on the answers that best fit the individual school system. By asking questions such as those listed, and by hammering out answers which reflect the sense of the group, the planning group will decide what it feels the basic skills ought to be. These values will form part of the foundation of the school curriculum and can be used, in conjunction with the planning group's knowledge of the existing and emerging research, to help make decisions about the nature of the basic skills program.

Tasks of the Planning Group: Analyzing Constraints

Constraints on school districts tend to fall into three categories: societal forces, administrative concerns, and perspectives of special groups. Every school district is subject to constraints of one kind or another, all of which further restrict the basic skills choices available to the planning group. In other words, the values identified through the process described in the preceding section are only part of the input the group will have to deal with; the degree to which the values can be reflected in the program will always be affected by the constraints which work upon the school system. Consequently, a second task of the collaborative planning group is to analyze these constraints and determine how they influence the principles which emerged as a result of examining values. The examination of constraints must be a continuing process.

Societal forces on school districts surface as explicit and implicit mandates. *Explicit mandates* include legislation which requires that certain textbooks or tests or programs be used or avoided, and court orders stemming from equal opportunity lawsuits which require that particular programs or procedures be followed or avoided. *Implicit mandates* include public opinion in the community, nationwide trends, and the concern of citizen groups representing educational views ranging from "back to basics" to "future shock." Both types of mandates restrict the range of options by dictating a school district's choices regarding basic skills. In the case of explicit mandates, it is unlawful for the school to adopt a basic skills program which conflicts with legislated or court-ordered programs. Ignoring implicit mandates, on the other hand, violates the tradition that American schools should provide educational services according to public preference.

School administrators are subject not only to the constraints described above, but to others as well. For instance, administrators must examine any proposed basic skills program from the perspective of what is being done currently. The implementation of a new program which requires drastic changes from the old is often logistically impossible (as when new records are required or extensive training is needed). Similarly, the initial cost of a program to a school district is a primary concern, as is its cost effectiveness over a period of time. Also, administrators are constrained by staff resources, both in terms of the number of professional and nonprofessional personnel needed to implement a particular basic skills program, and in terms of the skills and abilities which those staff members must have. Finally, and certainly not least, is the administrator's concern for the impact of the basic skills program on public relations. The administrator depends upon the public for the financial support of the school and must therefore be cognizant of how the proposed basic skills program will be perceived by the public.

. . . school systems are not free to implement without restraint their beliefs and values about basic skills. Rather, they must filter these beliefs and values through the restrictions imposed by the explicit and implicit mandates of society, by the realities of managing a school system, and by the various special interest groups that put pressure on the schools.

Each of these factors is part of the administrator's reality, and each restricts the range of decisions which can be made regarding the nature of the basic skills program. Administrators can only go as far as financial resources, staff resources, and the approval of the public will permit.

Also shaping the nature of a basic skills program are those groups representing special interests. Two current examples are the advocates of programs for bilingual children and for handicapped children. Whatever shape the basic skills program takes, it must account both for the concerns of those who say that non-English-speaking students in our population are being ignored and for the legislated mandates regarding mainstreaming of special education students.

In short, school systems are not free to implement without restraint their beliefs and values about basic skills. Rather, they must filter these beliefs and values through the restrictions imposed by the explicit and implicit mandates of society, by the realities of managing a school system, and by the various special interest groups that put pressure on the schools.

Tasks of the Planning Group: Combining Constraints and Values

A particularly difficult phase in the creation of a basic skills program is that of bringing constraints and values together to form program policy. Neither the values nor the constraints can be neglected or carelessly compromised. If values are neglected to accommodate the constraints, the result may be a basic skills program built on expediency. If constraints are neglected and values emphasized, the result may be a plan which sounds nice but is dismissed by everyone as unrealistic. Comprehensive and consistent basic skills programs must be based on the principles people value and on the realities of the situation in which the program is to be implemented.

One way to examine both values and constraints in a systematic way is to list the values held by the district in one column, the constraints (if any) which limit that value in another, and the modified program policy in a third. For instance:

Value: Children's reading growth should be evaluated by noting how often they use reading in real-life situations.

Constraint: The state education department has mandated the use of an annual test to evaluate students' skill acquisition.

A possible program policy: Evaluate in two ways: use the state test to evaluate skill growth, and note how often the children use reading for your own evaluative purposes.

Note that the hypothetical school system holds a value which seems diametrically opposed to the constraint imposed by the state education department. However, by clearly identifying both the value and the constraint, a decision evolves which effectively deals with both. Other examples can be provided. For instance:

Value: Children should become involved in mathematics as a process of thinking rather than being limited to computation.

Constraint: Teachers do not have the training or the material to implement a program which develops mathematics as a thinking process.

A possible program policy: Institute a five-year plan in which in-service training is offered and materials are purchased gradually over an extended period of time.

In this case, an analysis of both the values and the constraints indicates that, while a current condition constrains the value, the implementation of a long-range plan gradually eliminates the constraint and makes the value a possibility.

Some values and constraints, of course, are actually in direct opposition to each other. For instance:

Value: Children should not receive instruction in mechanics or grammar until after they are writing fluently.

Constraint: In response to a lawsuit, a judge issues a court order requiring that children immediately be given instruction in the individual mechanical skills of sentence structure and punctuation.

A possible program policy: The two are probably irreconcilable; the schools would have to comply with the court order rather than delay instruction in the mechanics.

In summary, the collaborative planning group can resolve the apparent conflict between constraints and values by systematically examining each value and any apparent constraint which seems to impinge upon it, analyzing the ways in which the apparent conflict can be resolved, and making a decision which implements the resolution. The result is a realistic policy statement which reflects the unique needs of and restrictions upon the school it is designed to serve.

Tasks of the Planning Group: Considering the Reality Faced by Teachers

The collaborative planning group's first crucial steps are the consideration of values and constraints and the systematic reconciliation of any conflicts between the two in order to define what the basic skills program will be for the school. However, one more crucial question remains to be considered: Will the classroom teachers who are expected to implement this plan be willing and able to do so? Failure to consider this question can often doom to failure an otherwise carefully conceived and painstakingly planned basic skills program.

The collaborative planning group must include the teacher's reality as part of their deliberations and must accurately appraise the degree to which curricular programs make demands which teachers are capable of fulfilling. Programs which conflict with the reality of the teacher's world will fail —

At issue here is the nature of the instructional demands of the proposed basic skills program as it meshes with what teachers can be reasonably expected to do. The givens in the instructional picture include the size of the class, the difficulties of managing the daily instruction of large groups of children, the shortage of materials and resources, the limitations of human energy, and the prior training and experience of the teacher. In short, whatever the basic skills program is, it must be manageable and usable by the teachers involved.

This aspect of the basic skills planning takes on even more importance when one considers that recent research indicates that teachers have little time to make significant instructional decisions as they go along (Buike, 1980; Morine-Dershimer, 1979; Sendelbach and Smith, 1980; Yinger, 1978). The task of managing thirty energetic and sometimes explosive youngsters for six hours a day and thirty hours a week is a demanding and draining one which teachers make tolerable by establishing routines that demand few spontaneous decisions, by employing recitation-like instructional formats, by making plans which emphasize activities rather than objectives, and by monitoring the activity flow of the classroom to ensure that all students are busily engaged.

Such structuring is not indicative of a lack of teacher professionalism. On the contrary, it is the reality with which the teacher lives each day — the work place has complexities and limitations which teachers must come to terms with in the process of carrying out their assigned teaching tasks. The collaborative planning group must include the teacher's reality as part of their deliberations and must accurately appraise the degree to which curricular programs make demands which teachers are capable of fulfilling. Programs which conflict with the reality of the teacher's world will fail — the plan can be made but teachers cannot implement that plan in classrooms unless it is compatible with the day-to-day realities of teaching. Often, the conceptions of people within the school itself vary about what the plans are. Ignanovich, Cusick, and Ray (1979) point out that the conceptions of curricular programs as expressed by central office staff are quite different from those expressed by classroom teachers. Consequently, basic skills plans need to be attuned to these problems as well as to the problems involved in dealing with values and constraints.

Conclusion

The Kamil paper presented a discussion of how legislation, research, and various models help to inform basic skills planning. This process was illustrated by a funnel in which the range of choices becomes narrower as more and more issues related to the basic skills are examined.

In this chapter, the funnel has become even narrower (see Figure 1) as the practical realities of the local school district are considered. Values, constraints, and teachers' perceptions all serve to narrow the range of options further, so that the planning task, while still extensive, at least has some boundaries. In this manner, basic skills options can be narrowed in a logical and rational manner, eliminating the necessity of selecting prepackaged answers, politically expedient programs, or "pie-in-the-sky" proposals.

Making choices among the basic skills options can be a frustrating experience, because divergent values and multiple constraints often seem to be more influential than definitive, empirically based answers. This occurs partly because of the lack of research-based answers for many questions and partly because the schools operate in a situation where many powerful influences must be considered. Too often the existence of many and (often) conflicting values and constraints leads to a situation in which professionals and parents make decisions which ignore some important factors.

Although it may be frustrating, the experience of reviewing and revising a basic skills program can also be illuminating and can lead to clearer thinking and better decisions about basic skills instruction. The purpose of this collection of papers is to help schools and school districts achieve clarity in their planning.

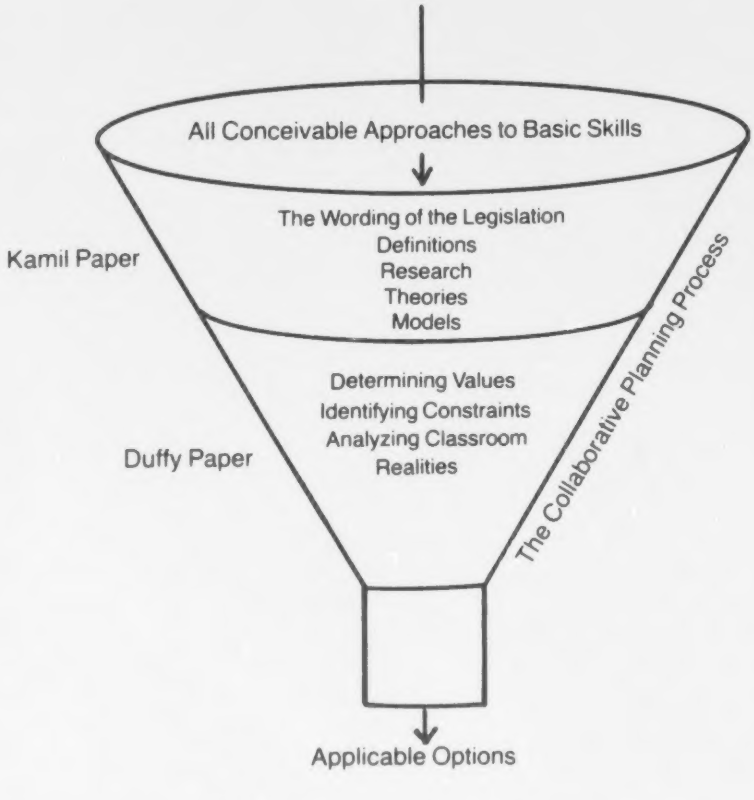
All Conceivable Approaches to Basic Skills
The Wording of the Legislation
Definitions
Research
Theories
Models
Kamil Paper
Determining Values
Identifying Constraints
Analyzing Classroom
Realities
Duffy Paper
The Collaborative Planning Process
Applicable Options

Figure 1. The Process of Making Basic Skills Choices

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At the Barricades: A Cautionary Tale

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Editors' Note: *In this paper Charles Allen describes one district's experience in developing tests and curriculum materials in response to a state mandate for meeting minimum standards before graduation. The author, who was a participant in the process, gives an overview of the experience and discusses some of the successes and problems. Although the content is mathematics and functional applications of computation skills, the problems experienced might have occurred with any of the basic skills. The reader should keep in mind that this paper is an account of one approach to a minimal competency program. This is not seen as including the whole of the mathematics part of a district basic skills program.*

Not all schools and school districts pass smoothly through the planning stage for new projects. This account provides an opportunity for the reader to follow our school district through a painful experience in developing a minimal competency program in mathematics. The instructional program developed in our district consisted of two parts. One part was an evaluative instrument designed to test proficiency in computational skills. The other was an instructional component designed to remediate students who failed the evaluative instrument.

Background

A state assembly bill required (1) that school districts prescribe a course of study that would assist students in developing skills and knowledge needed for adult life; (2) that districts clearly define minimum standards of proficiency in reading, writing, and computational skills; and (3) that students demonstrate proficiencies in these skills prior to graduation. The challenges that each affected district faced immediately after the passage of this bill were numerous. Meanwhile, the legislation itself was subjected to many and varying interpretations. Some of the districts concerned raced off to be the first to develop the prescribed programs while others waited to see what further legislative changes would be made. The alternative temptations — to reinvent the wheel or to make minor adjustments in existing programs — were both present. Media presentations sometimes served to confuse rather than clarify the matter. As the legislation was gradually interpreted by consensus among the legislators, they passed additional legislation. Additional subject areas were considered for similar treatment. Our district kept one ear to the grinding of the legislative mill, and worked rapidly to develop more than one alternative to meet the requirements.

Materials Development

Our district decided to develop its own tests and remedial curriculum materials. A team of teachers was to do the major development work, and a full-time, temporary teacher consultant was selected to direct the development of the materials. This consultant was to work closely with a mathematics specialist, who eventually was to do the major work of implementing the materials developed. The consultant was challenged to be original and to attempt bold new approaches wherever appropriate. It was assumed that the quality of any materials developed would depend chiefly upon the abilities of the writing team. Present and former mathematics teachers were invited to participate, and a citywide request for names was made. Of the eighty teachers suggested, twenty-five expressed an interest in participating. Fifteen teachers were eventually selected to write the materials.

The difficulties facing any team of writers are massive. All of the teachers selected were encouraged to use their outstanding individual talents to the fullest, yet the results were to come from a balanced team effort. The problems inherent in team writing are the same, whether the authors are professionals working for royalties or teachers writing on released time without pay.

The consultant first made a search of the existing literature on the tasks facing the writing team. The sources consulted were proficiency tests, the California Survey of Basic Skills, curriculum guides, equivalency tests for high school mathematics classes, district graduation requirements, journal articles on minimum competencies, the California State Framework for Mathematics, reports from other states, tests from other school districts, the New York Regency Exams, and our district's own reading test.

Many heated writing-team sessions were held to define a basic skill, to identify the target population, and to design the most appropriate instructional components. Like most other groups tackling such a chore, we were unable to reach consensus on the definition of a basic skill. To save team research time, the teacher consultant presented the team with a synthesis of the research identified through the literature search (with copies of the research documents for those desiring to do their own reading). Experts from research and development presented sessions on test writing, parameters, item distractors, stems, and criterion-referenced testing. An exercise to identify the mathematics needed to confront a menu in a restaurant was the catalyst that started the team writing test items, identifying skills, and designing prototype lesson formats. Many team discussions were held, and eventually the teachers emerged with some sample test items and prototypes of lessons designed to remediate for those items. In the process we had found it necessary to learn to criticize, to disagree, and to work together.

Target Population

While the legislation mandated that all students would have to pass the test, the team decided that it was necessary to identify a target population to help us focus our work. There would be many students, of course, who would not have any trouble passing the test. The students that were to be kept in mind from start to finish were those who were not likely to pass. It was these students who would be exposed to the special instructional materials designed to get them ready to pass the test the next time. Our team was unanimous in deciding that the student who would fail the test would probably be a student in basic mathematics or some other remedial math class.

Delineation of Survival Skills

The team members felt that the test should focus on the math skills needed for "survival" in today's world. This basic orientation immediately suggested possible questions. What kind of mathematics is necessary for the individual? Should more than one aspect of the individual's life be considered? Eventually the team decided to treat the individual as (1) a student, (2) a consumer, (3) a worker, and (4) a person, family member, and friend. After isolating the major "survival" tasks related to each of these roles, and deciding what role mathematics played, the team decided to develop materials around eight topics: Banking, Expenses, Measurements, Money, Pricing, Taxes, Wages, and Whole Numbers. Specific tasks were grouped under these eight topics. For example, tasks thought to be related to the first three topics were

Banking

1. Make a deposit and compute the balance.
2. Write three checks and compute the balance.

3. Make a deposit of coins, currency, and checks; know the sum of the deposit.
4. Write a check and compute the balance.
5. Check the entries on a check register and find the mistakes made.

Expenses

1. Compute the amount of an order from a menu.
2. Compute the amount of an allowance remaining after expenses.
3. Compute the average weekly expenses.
4. Compute the cost of parking for five hours.
5. Compute the rental expense for ten days.

Measurement

1. Compute the times at which medicine should be taken.
2. Compute the elapsed time.
3. Compute the distance a car will run on twenty gallons of gasoline.
4. Change two different units of measurement to one unit.
5. Compute the number of gallons of paint needed.

Community Involvement

At this point, the writing team decided to ask for comments and suggestions from the community at large. The list of skills was accordingly sent out to the educational community, and to the parental community of our students as well. The news media were also given copies of the list. Our intention to develop a test received reasonably extensive coverage in the media. The anticipated feedback from the educational and parental communities, however, did not materialize. The returns were minimal compared with the distribution.

Conflicts

There was hard work and lively conflict in the writing team process, but most teacher participants had good feelings about the results. This rosy condition soon changed. The subsequent involvement of research and development experts and commercial publishers produced more conflict and less good feeling.

Conflicts within the writing team. No effort will be made here to give the details of how test items and instructional materials were developed by the writing team. Some of the general problems our writing team confronted while constructing the test clustered around the following issues:

1. Translating the highly technical descriptions of the criteria as set forth by research and development experts into easy-to-understand terminology for the lay community.
2. Using artwork to make the test appear as close as possible to the real world.
3. Testing a single skill with each single item.
4. Keeping the reading and writing skills involved at a very minimum.
5. Relating the test items to the world of the student, even though the skills will be used primarily in the world of adults.
6. Selecting test items that would permit easy updating and revising in subsequent years.

Teacher-researcher conflicts. The conflict between the teaching team and the research and development experts over objectives appeared inevitable. Two different worlds were represented in the encounter. We teachers felt that we were on the firing line, working with live human beings daily. At the same time, we pictured the experts living in ivy-covered towers, communing with lifeless statistics. The fictitious confrontation below typifies the conflict between the teachers and the experts:

Teachers: We want the kid to know how to make a deposit.
Experts: That is not an objective.
Teachers: How about, Make a deposit of coins, currency, and checks; know the sum of the deposit.
Experts: Do you have any parameters?
Teachers: Who needs them?
Experts: We do, to generate additional items.
Teachers: Who needs additional items?
Experts: You do, unless you wish us to generate them.
Teachers: Given a deposit that includes at most nine items in bills, and coins totaling at most $20, and at most three checks of less than $30 each, compute the amount of deposit.
Superintendent (intervening): What do you have that we can send out to the public to obtain their necessary input?
Teachers: With or without parameters?

Test format conflicts. The teachers decided that artwork would contribute crucially to making the students feel that they were in the real world when taking the test. In the sample test items planned by the teachers, the artwork and the written problem were placed next to each other. However, the research and development experts modified this test format. As the experts modified it, the material complexity of the test increased. The student had to look at the display, then at the questions below, then at the scratch paper to do the computation, then back at the questions with choices, and finally at the answer sheet to bubble in the correct answer. A reading test had been developed that used a similar display technique. In reading, however, it is normal to look at a picture or read a paragraph and then respond to questions about it. In the case of mathematics, the necessity for computation complicated the situation. The teacher team felt that a design failure had been built into the test even before it was written. However, the professional test writers thought otherwise and the format was modified.

Timing conflicts. The question of when to administer the test opened another area of conflict between the teacher team and the research and development experts. The state legislation required that students be tested no earlier than the junior high school years and no later than the senior high school years.

Teachers: Give the test in the seventh grade and release the capable students from this particular graduation requirement.
Experts: That's too early to meet the requirements. Try this test in high school and develop another test for junior high school.
Teachers: But balancing a checkbook is the same at both grade levels.
Experts: That's true, but kids tend to forget.
Teachers: We don't call back the graduates each year afterwards to test for retention.
Experts: Perhaps we should. We can generate items for such testing.

Instructional Component

The second component of the district's minimal competency program was instructional in nature and was designed for remediation. The instructional materials evolved into "community" throw-away newspapers.* There were eight issues, with one for each of the eight topics on the test. The papers were designed to look like anything but a textbook; the pages were laid out to resemble anything but a series of lessons. A sequence for studying the papers was avoided. (Teachers were even free to investigate each issue in any manner they thought reasonable.) Regular features of each issue were

1. Know the Language — the vocabulary necessary for the skills.
2. In This Issue — computational skills needed for the topic.
3. S.P.D.C. — Same Problem, Different Computations, an attempt to help students generalize their skills and transfer them to similar problems.
4. Masthead — an attempt to keep before the student the entire program.
5. Check Off — a chance for the student to evaluate his or her mastery of the skills.

The objective of the newspaper was to present a minimum course offering that the teacher might supplement with activities, laboratories, field excursions into the community, or even necessary drill in computation.

Conclusion

The tests and instructional materials developed by the team went on to editing, to printing, and to eventual commercial publication. This process gave the appearance of success, but to most of us teachers involved in the development there have been many causes for regret. Some of these causes have been suggested previously. There were others:

1. In addition to the survival skills the teachers had recommended, items were added on buying theater tickets, backpacking, credit-card statements, time zones, and weather maps.
2. The test looked no different than the district reading test. Many of the first students

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*Readers interested in seeing a copy of a "community" newspaper can write to the Los Angeles Unified School District.

taking the test failed because of the reading difficulty rather than math deficiencies.

3. When the publishing company obtained rights to the materials, it decided to change the newspapers into task cards.
4. The already printed newspapers were distributed to teachers without instructions on how to use them. To send innovative material without instructions for implementation is the death knell for any new program.

Our primary cause for regret, however, was the way the tests and materials were actually used in instruction. Students who failed the test were remediated in ways other than those we had planned. They were often assigned textbooks, textbooks having no direct relationship to the test, and put through pages and pages of drill. The two-part program envisioned and designed by the teachers was not implemented. But, more significantly, the students did not realize that mathematics can sometimes be fun. And, also significantly, they have failed tests on computational skills regardless of the efforts made to get them to pass.

Some of the problems discussed here are currently being addressed in our district; it appears that others may be here to stay. This account of the problems and conflicts encountered in one district is not intended to discourage all district planners, but to identify some common pitfalls. We don't all have to fall into the same pit.

Characteristics of Successful School Programs in Basic Skills

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Editors' Note: *Some schools, regardless of location and socioeconomic status, consistently have higher achieving students. Improved instruction and improved student outcomes are generally goals of basic skills programs. In this paper Jay Samuels reviews several studies which, over the last fifteen years, have shed light on nine factors consistently found in effective schools. These factors are all directly under the control of the school staff. From Samuels' observations, the best laid basic skills plan will have little positive impact (or may have a negative impact) if the factors discussed in his paper are ignored.*

The concept of literacy has expanded during the last several centuries. During George Washington's day, for example, people were considered literate if they could sign their names (Resnick and Resnick, 1977). Nearly two centuries later the United Nations decided that people should be able to read with understanding and write a simple paragraph about everyday life in order to be considered literate. In a sense, the recent basic skills improvement legislation has expanded the concept of literacy by including among the basic skills reading, mathematics, writing, and oral communication. The Federal Basic Skills Improvement Program and many other federal, state, and district programs have as a primary goal the improvement of instruction in the basic skills.

The purpose of this paper is to help school systems establish more effective basic skills programs. The paper will (1) describe the characteristics of exemplary reading programs; (2) describe the practices of various school systems which are ineffective or counterproductive; (3) present new information regarding the difficulties schools have experienced in maintaining and establishing quality programs; and (4) present a model of school practice that should prove useful in establishing quality programs across a variety of subjects.

Before summarizing current research findings, we must offer two qualifications. First, educators are in no greater agreement about how to increase educational achievement than physicians are about the prevention and cure for heart disease or economists are about the problems of our economy. Some educators may object to ideas presented in this paper because they do not correspond to their own views of how to improve achievement.

Second, we will apply results obtained in the reading area (where extensive research on characteristics of exemplary programs has been done) to areas where far less research is available. We recognize that subjects such as mathematics may require special equipment — the use of *manipulables*, for example — not used in reading, but, in general, we feel the principles derived are applicable to other subjects.

Components of Successful Reading Programs

A good reading program is considerably more than a reading method. It may include factors and variables ranging from subtle assumptions about the ability of children to master basic reading skills to the acceptance of the premise that the school is the primary agent responsible for helping children master basic academic skills. In addition to the shaping assumptions that underlie the programs themselves, other important factors include such items as personnel, training and supervision, application of the principles of learning, and the nature and importance of evaluation.

Underlying Assumptions. There are several important assumptions or beliefs held by the staff of exemplary reading programs which seem to be associated with student academic growth. The first assumption is the belief that the school can have a significant impact on the academic achievement of its students. Consequently, the school holds itself responsible to a large extent for both the success and failure of its students. The second assumption is that most children are capable of mastering the basic academic skills. Teachers and administrators who hold these assumptions do not try to absolve the school of responsibility for student failure with excuses like "poor motivation," "lack of readiness," or "inadequate home background conditions." Instead, when students fail to learn, the school staff assumes the major responsibility for identifying and correcting the situation.

Personnel — *Administrators*. More often than not, an exemplary reading program has a strong administrative leader. In fact, the Rand Corporation report on implementing and sustaining educational innovation across a variety of subject matters states that the importance of administrators to the creation and maintenance of innovative practice can hardly be overstated. Administrative support, in the form of encouragement and the creation of an organizational climate giving the project "legitimacy," is essential to the project's development, operation, and maintenance. The support which the administrator gives is not in "how to do it" but in providing time for planning and carrying out decisions, securing necessary financial support, working with school personnel on a regular basis, and running interference against any counterforces in the school or community (Berman and McLaughlin, 1978, pp. 30-31).

Teachers. The belief system of the teacher is important to the success of a program. Necessary elements in the teacher's belief system are feelings of commitment to and support for the project goals. These feelings grow out of the social and psychological forces which operate in a school district and motivate the teacher to provide the time and energy necessary to implement the project goals (see Samuels and Edwall, 1976). The teachers typically found in exemplary reading programs believe that student success or failure depends upon what happens in the classroom and that student failure is not acceptable.

Berman and McLaughlin report that teachers rise to challenges. Ambitious and demanding programs seem more likely to win the commitment of teachers than routine projects, because a demanding program appeals to a teacher's sense of professionalism. One major reason teachers are willing to take on the challenge of attempting to bring about change in themselves and their students is their belief that they will become better teachers and that the students will benefit (1978, p. 25).

Teacher aides. In order to reduce the student-to-teacher ratio, the exemplary programs often used teacher aides in direct instruction. The aides had received training, so that an observer in a classroom might find what appeared to be anywhere from two to four teachers present.

Reading specialists. A number of successful projects used specialists. The specialists were used in a variety of ways, from helping to train staff to providing materials to serving as on-the-job consultants. The specialists did not work directly as remedial education teachers but had an indirect effect on student learning by working with teachers and teacher aides.

Teacher Training and Supervision. There seems to be strong support for teacher training in investigations of exemplary reading programs. Berman and McLaughlin conclude that educators and government officials have been too optimistic about how much time is needed to produce change in an educational system.

Their study indicates that it takes two years to get a project off the ground, two years to implement it, and an additional two years to produce a stable effect on student achievement scores (1978, p. 35).

The teacher training occurs during the two-year start-up time and the two-year implementation time. Berman and McLaughlin state that the training experiences which were helpful were

1. Concrete, teacher-specific, and ongoing training.
2. Classroom assistance from project or district staff.
3. Observation of the project in other classrooms or districts.
4. Regular project meetings.
5. Teacher participation in project decisions.
6. Local materials development.
7. Principal participation in training. (1978, pp. 29-30)

In order to insure implementation of prescribed teacher practices, instruction was supervised in some of the successful inner-city projects.

Curriculum — *Orientation.* Although the primary focus in the successful programs was what might be thought of as *task orientation*, there was a *human relations orientation* as well. The human relations orientation is one in which students find the classroom to be a friendly and supportive place to work. In other words, when task orientation is combined with a positive classroom climate, the situation is conducive to academic growth.

Skills-centered curriculum. Most successful reading programs studied included instruction in phonics. In addition, these programs provided experience in reading meaningful and interesting material in context. Unfortunately, the research studies did not include sufficient observation of instruction to provide reliable indications on how subskills instruction and meaning-oriented instruction were combined.

Relation of objectives, instruction, and materials. The successful reading programs had clear and specific objectives. In the exemplary programs both the type of instruction and the materials used were appropriate and relevant to the specific program objectives.

Time. While it is essential to allocate sufficient time for learning to take place, it is equally important that the available time be used efficiently. In successful programs, teachers were able to devote more class time to task-related activities, and the major part of the school day was spent in structured activities that left little unoccupied time. In addition, instruction was kept at a low level of complexity. In several of the successful programs, extra amounts of time — time which was used efficiently — were allocated to reading.

Structure. Structure is an important vehicle in providing time for learning. In a sense, structure is part of good classroom management. Routines are established in order to facilitate the movement of students and materials. The classrooms in the successful programs studied were described as being orderly, with less time wasted on discipline problems, giving instruction on routine matters (such as passing out books), and transition from one activity to another. In addition, the successful programs actually assisted teachers in establishing good classroom management, so that time would not be wasted.

Assessment. In the exemplary programs student progress was monitored through frequent assessment — both formal and informal — of progress. The assessment data were used to make decisions about instruction.

It is now possible to examine the characteristics common to the reading programs studied. Table 1 conveniently summarizes the components of each of these successful approaches to reading instruction.

Characteristics of Unsuccessful Reading Programs

It is undoubtedly useful to know the characteristics associated with successful reading programs. However, if we wish to build programs which will increase reading achievement, it is probably equally important to recognize the characteristics associated with those programs which were unsuccessful. Several reports have described characteristics of programs which did not significantly improve achievement (Armor et al., 1976; Berman and McLaughlin, 1978). A summary of those characteristics is presented below.

Table 1
Extent to which Exemplary Reading Programs Shared Common Components

Components	Weber (1971)	Hawkridge, Tallmadge, and Larsen (1968)	Wargo, et al. (1972)	Harris and Serwer (1966)	NY State Office of Education (1974)	Direct Instruction (Becker, 1978)	Wilder (1977)
Strong administrative leadership	+	+	+		+	+	+
High expectations and the belief that the teacher can make the difference	+		+	+	+	+	
Teacher aides used in direct instruction	+	+	+			+	
Reading specialist	+		+			+	+
Teacher training	+	+	+		+	+	+
Teacher role — present, diagnose, remediate	+	+	+			+	
Specific reading objectives	+	+	+	+		+	+
Skills-centered curriculum	+		+	+		+	+
Instruction and materials relevant to goals	+	+	+			+	+
Structured environment	+		+		+	+	
Positive classroom climate	+		+		+		
Efficient use of time	+	+	+	+		+	+
High intensity of treatment	+	+	+	+		+	+
Frequent evaluation of student progress	+	+	+		+	+	
Supervision of teachers			+			+	

+, Component was identified in the report.

Improper Program Initiation and Implementation. Before a program can work, there must be a climate of enthusiasm, commitment, and support for it from school personnel. It is this climate of commitment and support which motivates the staff to implement and translate the project goals into effective classroom practices. The following approaches to program initiation fail to create the necessary climate for support and implementation (Berman and McLaughlin, 1978).

Opportunism. The motivation for the initiation of the project is opportunistic, a response to political pressure, or an attempt to get federal money. Opportunistic initiation is characterized by lack of support and commitment from both central office and project staff. Since there is lack of support at any level, the staff is unwilling to invest the resources, time, and energy necessary to implement the project.

Top-down motivation. Although the central-office staff is sincerely interested in the program, they fail to win the support of the project staff. Consequently, the project staff do not invest the time and energy necessary to implement the project.

Bottom-up motivation. The "grass-roots" enthusiasm of the instructional staff is not matched by the central office staff. Consequently, there may be inadequate project implementation because the central office fails to allocate a sufficient amount of resources and staff services.

Inadequate Incubation and Development Time. A reading program is broad in scope, incorporating elements which include personnel, methods, materials, finances, and students. Changes that affect this many elements require considerable periods of time for planning and implementation. As previously noted, current research suggests that significant innovation requires at least six years. Some unsuccessful projects moved forward too quickly in their planning and failed to create the necessary climate for district support and commitment.

Narrow, Piecemeal Approaches. There are so many important elements in a good reading program that simple, "quick fix," single-element approaches usually cannot produce a significant impact on achievement. To produce such a significant impact, a comprehensive approach is required.

Lack of Commitment, Feelings of Inadequacy. The less successful projects often had staff who either did not have a feeling of commitment to the project plan or else lacked a sense of efficacy regarding their ability to bring about the necessary changes.

Nonsupportive Principal. The support and leadership of the school principal are vital to a successful project. In the unsuccessful projects, the principal often failed to create an atmosphere which emphasized hard work and dedication and an environment which supported teacher efforts and protected the teachers from disruptive forces.

Inefficient Use of Time. Time is a critical variable in learning. It is obvious that if mastery is to occur, the amount of time allocated must be commensurate with the needs of the students. It is also important that the allocated time be used efficiently. In the unsuccessful classrooms, time was wasted because routines were not established and there were often interruptions brought about by discipline problems.

Problems in Maintaining and Disseminating Quality Programs

The purpose of this paper has been to describe the characteristics of successful and unsuccessful reading programs in the hope that this information will help schools establish more effective environments for basic skills programs. Knowing the characteristics of successful programs, however, is only a starting point for teachers and administrators.

Schools which currently have successful programs are faced with the task of maintaining their quality programs. Berman and McLaughlin reached some sobering conclusions regarding the maintenance and dissemination of quality programs. First, successful projects were not easily disseminated to new sites, and the performance levels in the new site often fell short of the performance levels in the original site. Second, even the original successful projects had difficulty sustaining their success over a number of years. Third, often when the original funding agency withdrew its financial support, the school district was unprepared to provide the level of support necessary to sustain the project (1978, pp. v-vii).

These sobering findings are neither surprising nor unique to the field of education. While we seem to know a considerable amount about the characteristics of successful programs, we still need to know a great deal more about which of these characteristics are essential to the continued success of a program, its longevity in the school or district, and its successful dissemination. Although the goals are difficult to achieve, they are well worth the effort.

Designing Effective Programs in Basic Skills

We are now at the point where we can combine the information regarding the characteristics of outstanding reading programs with selected principles of learning. The resulting model should help facilitate the design of effective basic skills programs.

As seen in Figure 1, there are three factors which interact with each other to influence learning. These factors are the student, the school, and the task. The student brings certain aptitudes, knowledge, and motivations to a task. If the task is one which is interesting to the student, and which utilizes the aptitudes and skills the student possesses, the task is made easier. The difficulty of the task is determined in part by the task variables — content (what to teach), sequence (when to teach), and method (how to teach). There is ample evidence that each of these variables can be modified to influence the course of learning.

The school factor includes such instructional variables as reinforcement, the establishment of objectives, the pacing of instruction, motivation, and feedback affecting instructional decisions. These variables are largely under the control of the school, especially of the teacher.

The model of the teaching process shown

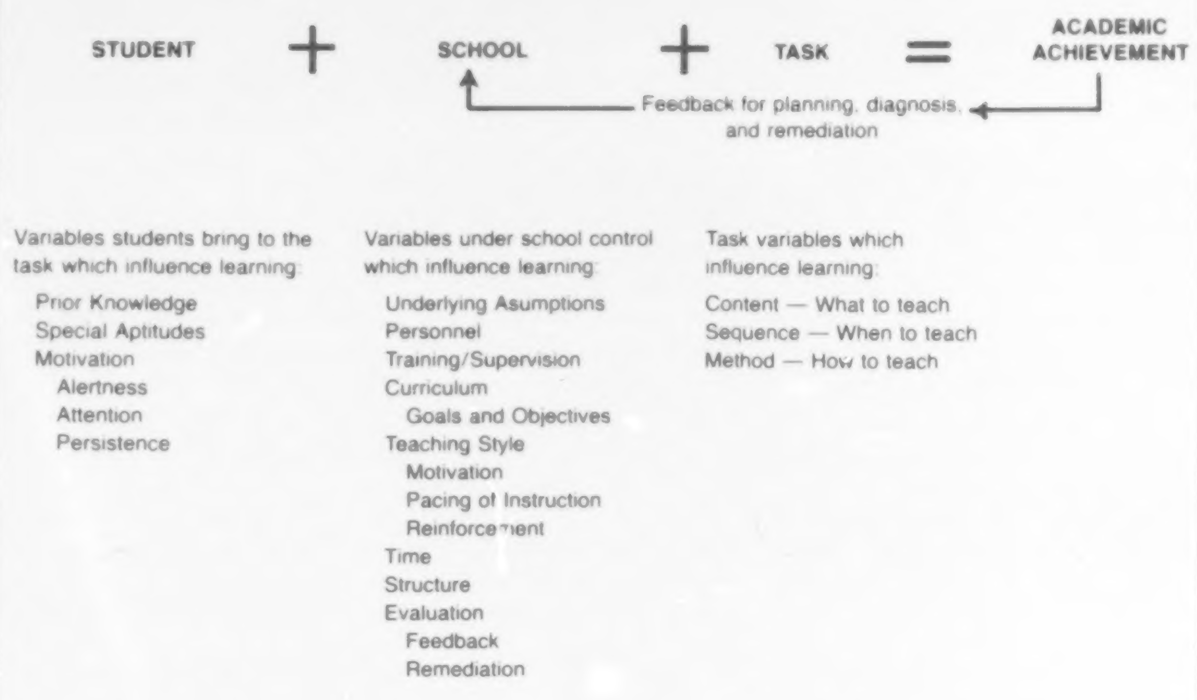
STUDENT
+
SCHOOL
+
TASK
=
ACADEMIC ACHIEVEMENT
Feedback for planning, diagnosis, and remediation
Variables students bring to the task which influence learning:
Prior Knowledge
Special Aptitudes
Motivation
Alertness
Attention
Persistence
Variables under school control which influence learning:
Underlying Asumptions
Personnel
Training/Supervision
Curriculum
Goals and Objectives
Teaching Style
Motivation
Pacing of Instruction
Reinforcement
Time
Structure
Evaluation
Feedback
Remediation
Task variables which influence learning:
Content — What to teach
Sequence — When to teach
Method — How to teach

Figure 1. Student, school, and task variables which influence academic achievement

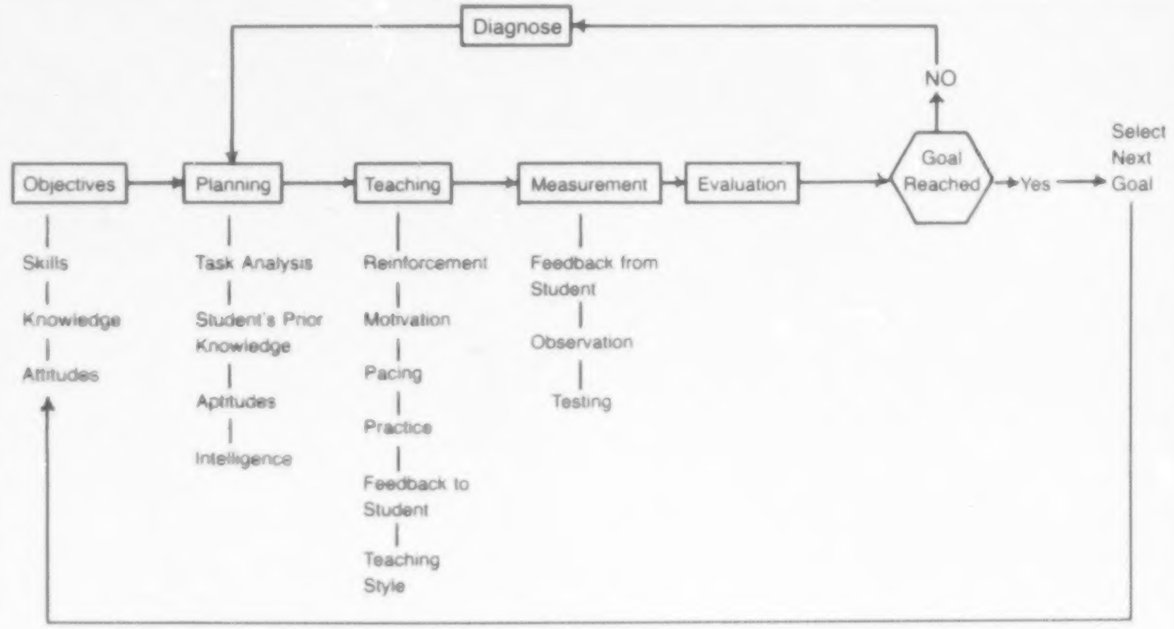
Diagnose
NO
Objectives
Planning
Teaching
Measurement
Evaluation
Goal Reached
Yes
Select Next Goal
Skills
Knowledge
Attitudes
Task Analysis
Student's Prior Knowledge
Aptitudes
Intelligence
Reinforcement
Motivation
Pacing
Practice
Feedback to Student
Teaching Style
Feedback from Student
Observation
Testing

Figure 2. How learner, school, and task variables are incorporated in a model of the teaching process.

in Figure 2 indicates some of the critical components. The importance of each of the components in the teaching model is underscored by the fact that effective teachers are aware of each of the factors and incorporate them in the teaching process, while ineffective teachers do not. For example, ineffective teachers may be unaware of the instructional objectives, or there may be a conflict between program objectives and the teacher's objectives. Ineffective teachers may also present information but fail to engage in frequent observation and evaluation of student learning. Either the failure to know instructional objectives or the failure to appropriately evaluate learner outcomes reduces the effectiveness of the instructional process.

Implications for Effective School Programs

Regardless of which of the basic skills is under consideration, the following factors should be considered.

Underlying Assumptions. The instructional staff — including administrators, specialists, teachers, and teacher aides — should believe that the critical agent for making the difference between satisfactory and unsatisfactory achievement is the school.

Incubation and Development. Bringing about change in a school system requires more time than most educators previously thought was necessary. Endeavors to improve instruction must be viewed as long-term commitments.

Personnel. A critical factor in the quality of school programs is the principal or other administrative agent who has the authority to establish the conditions necessary for improving program quality: (1) setting aside the time necessary for planning; (2) helping to get financial support; (3) working with school personnel on a regular basis; and (4) acting as a buffer against counterforces.

The teachers must have a feeling of commitment to the project goals and methods and must be assisted in direct instruction by trained teacher aides. Teachers must also have access to specialists who can serve as consultants and provide training and materials.

Teaching Style. Teaching style should be a combination of task orientation and human relations orientation. The teacher should endeavor to help students master the program objectives in an atmosphere which is friendly and supportive. This results in a classroom which is both work centered and human relations centered.

Teacher Supervision. Supervision of instruction can be used to ensure that teachers are fully implementing the program.

Curriculum. Regardless of which of the basic skills is under consideration, the program objectives should be stated in a manner that is both clear and specific.

Time. Time is a critical factor in all instruction. If the amount of time allocated for instruction is equal to the amount of time each student needs, then all students whose intellectual capacity is within the educable range should be capable of mastering the basic skills. Under these conditions, what varies is not mastery but the amount of time each student needs in order to achieve mastery.

While school personnel have often heard the phrase *individual differences*, our schools have done too little to accommodate the variability we encounter in our students. Slow learners and other children with special needs — handicapped children and children for whom English is a second language — must be given adequate time to learn the basic skills. Educators must also work harder to discover new ways to motivate children who have difficulty learning.

Structure. Since so many of the behaviors associated with teaching are of a repetitive nature, it is useful to establish routines. Such routines assure that time is used efficiently. Students and other staff can take over many of the classroom chores, leaving the teacher to handle tasks which cannot be made routine, such as planning, evaluating progress, diagnosing problems, motivating students, working with gifted students and slow learners, and providing the human factor so vital to classroom climate.

Assessment. A thorough, accurate record-keeping system for keeping track of the progress of each student must be used. In order for evaluation to be useful, it must be designed to facilitate instructional decisions and must be an ongoing process.

Conclusion

As mentioned previously, there are no "quick fixes" or easy solutions to the problem of building an outstanding basic skills program. Complex problems demand complex solutions. Those who look for easy answers to our complex problems in education are searching for a magic bullet which does not exist. When one considers all the factors which must go into a good educational program, it is apparent why an extended amount of time is required to attain this goal. Although the task is difficult, as educators we must rise to the challenge and build more effective basic skills programs.

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Skill Definition in State Competency Testing Programs

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Editors' Note: *This paper by William Gorth and Marcy Perkins is intended to familiarize the reader with some typical state-mandated* minimal competencies *programs. They distinguish state competency testing programs by the skill areas included, the degree of functional or academic emphasis, and the purpose for which testing is used. In addition state programs differ in the amount of state determination of skills content and program design. The state programs reviewed here are not being presented as basic skills programs but as one of the many inputs that must be taken into account in planning a basic skills program. This information and the full report from which it is taken may also be helpful to states which are in the process of planning or revising minimal competencies legislation.*

The purpose of this paper is to summarize the approaches that five states — Georgia, Michigan, Virginia, Massachusetts, and New York — have used in defining and developing basic skills competencies within their competency testing programs. By considering a wide variety of programs, which represent a broad spectrum of philosophies and approaches to the subject, we hope to provide state and local education agencies with a range of options for consideration as they attempt to formulate their own programs.

In each summary, the skills which the state considers to be, or defines as, "basic" are identified. The summary also discusses the emphasis placed by the state on "life skills" — functional, life-coping skills — and on academic skills. The complete descriptions of all of the major characteristics of these programs and those of the forty-five other states are available from the Office of Testing, Assessment, and Evaluation of the National Institute of Education (Study of Minimum Competency Testing, 1979).

Overview

The summaries of the five state programs describe the states' efforts to address the problem of identifying and defining minimum competencies and basic skills. It is apparent that each considered a variety of approaches during its developmental process before arriving at the program which was finally adopted as that best suited and most relevant to its particular student population.

Four of the programs identify the subject areas of reading, mathematics, and communication (oral and written) as basic skills test areas. Massachusetts has also specified listening as a basic skill to be tested. Georgia has chosen to test only in the areas of reading and mathematics.

The states also had to choose whether to focus on the functional aspects (life skills) or on the academic aspects of the educational process. Georgia placed heavy emphasis on a functional orientation, Michigan emphasized the academic, and Massachusetts, New York, and Virginia each arrived at the conclusion that program objectives should treat both skills categories — these states differ in the degree of emphasis placed on one or the other.

Students in Georgia, New York, and Virginia must pass the state test as part of the requirement for promotion or graduation, or both. Massachusetts and Michigan have chosen to emphasize the use of test results for remediation or curriculum improvement.

Georgia

The approach adopted by the state of Georgia provides us with an example of competency-based education which places strong emphasis on the student's attainment of life-role skills, that is, the student's ability to apply subject area skills to practical life situations.

The development of competency performance standards for high school graduation began in 1976 with the adoption of State Board of Education *Policy 30-700, High School Graduation Requirements*, which states, "The Board of Education defines as a major role of the public schools the responsibility to ready the children and youth of Georgia for contemporary life roles." The policy goes on to define requisites for five sets of life-role skills for the student:

> *As Learner:* Proficiency in (1) reading, writing, analyzing, and speaking, (2) basic computing skills, (3) acquiring knowledge and understanding on one's own, during and after the formal education process;
>
> *As Individual:* Possess the skills necessary to (1) improve one's physical and mental health, (2) use leisure time in a profitable and fulfilling manner, (3) establish a family role mutually beneficial to him/her and other members of the family;
>
> *As Citizen:* Possess the skills and understanding necessary to become a responsible member of society, both using and contributing to society in an appropriate manner, and to interact with the environment in a responsible way;
>
> *As Consumer:* Possess the skills and knowledge necessary to be an informed consumer in order to use available resources in an efficient and beneficial manner;
>
> *As Producer:* Possess the skills and knowledge necessary to select and pursue a career which reflects one's abilities and also to be able to pursue an alternate career, should circumstances demand such a change. (p. 23)

Ten competency standards for the adult life-role of the learner category were measured first in 1981, when a criterion-referenced test, based on these competencies, was administered to all tenth-grade students (see Table 1).

Criterion-referenced tests developed for grades 4 and 8 are limited to the content areas of reading, mathematics, and career development, with the purpose of measuring the learner's progress toward the objectives outlined above for high school students. These tests were also administered for the first time in 1981.

Michigan

The Michigan program, the Michigan Educational Assessment Program (MEAP), currently focuses on the subject areas of reading and mathematics, but the state plans to develop minimum competency tests in several additional subject areas. Unlike Georgia, the emphasis, at least initially, has been on the mastery of academic skills (as opposed to life skills) prior to the student's entry into high school. Therefore, reading and mathematics tests are administered to all fourth graders and seventh graders in the fall of each year. The program tends to focus on the early detection of remedial needs and is not linked to the student's grade promotion.

The State Department of Education has developed two related sets of competencies for MEAP. The first of these is a broad set which includes competencies the state considers to be minimum requirements within each subject. This broad set of competencies encompasses the second set, which includes the official competencies which are the basis for the present legislatively mandated testing program.

In developing the competencies, the Department made three decisions. First, they considered the competencies to be minimum levels of achievement which almost all students should attain before the age set for assessment. In other

Table 1
Competency Performance Standards Required for Graduation

Learner

1. The student reads and interprets communication on a functional level.
2. The student comprehends information received and applies that information in a variety of everyday situations.
3. The student writes legible, appropriate personal and career communications on a functional level.
4. The student receives and transmits oral and visual communication on a functional level.
5. The student employs estimation, approximation, and calculation skills in everyday living situations.
6. The student understands and uses various forms of scales and measurements, graphs, charts, tables, symbols, and other graphic representations.
7. The student applies basic arithmetic operations (adding, subtracting, multiplying, and dividing) in an everyday context.
8. The student recognizes basic geometric shapes and positions necessary for daily mathematical functions.
9. The student uses a variety of information resources to obtain assistance and information.
10. The student employs logical, intuitive, and creative thinking processes.

Individual

1. The student knows appropriate emergency responses to accidents and demonstrates preventive actions for health and safety hazards.
2. The student recognizes and practices sound personal health habits necessary to maintain physical and mental well-being.
3. The student understands the sound health care involved in family living, parenting, and parenthood.

Citizen

1. The student understands the basic structure and functions of the American system of government and the American economic system.
2. The student knows basic legal rights and responsibilities of the citizen under the American judicial and penal systems.
3. The student recognizes relationships between current societal and environmental problems and the individual's role and responsibilities.

Consumer

1. The student knows the principles of sound personal financial planning and management.
2. The student identifies the legal rights and responsibilities of the consumer in buying and selling goods and services.

Producer

1. The student analyzes personal career opportunities and choices in career planning and management.
2. The student demonstrates the skills necessary to obtain employment.

Source: Educational Testing Service. *Grades 4 and 8, Georgia Criterion Referenced Tests: Technical Manual.* Princeton, New Jersey: 1978, pp. 14-15.

words, grade 4 students should have acquired the competencies of grades 1-4 or should at least have the opportunity to learn these competencies soon after testing.

Second, the Department considers the competencies to be closely related to academic or school skills; the competencies therefore derive from the types of skills a student is expected to learn in a classroom. In their recent revision of test items, however, the Department has begun to develop items which assess the academic skills using life-related contexts, particularly for the twelfth grade.

Finally, the Department has determined that the MEAP competencies should all be able to be measured by multiple-choice, paper-and-pencil test items for the required testing of every student.

Since the Department intends to test in all of the competency areas eventually, the full set follows. Tests for those competencies not currently assessed are under development. Any test effort based on the full set of competencies is at present purely voluntary on the part of local districts and is unassisted by the state.

Competencies, called "minimum performance objectives," are available for the following skill areas and grade levels (Michigan State Department of Education, *Alternative Forms*, 1979, p. 9):

Grade 1

1. Affective
2. Cognitive
3. Psychomotor
4. Social-emotional

Grades 4, 7, and 10

1. Art
2. Communication Skills
3. Health Education
4. Mathematics
5. Music
6. Physical Education
7. Science
8. Social Studies

Grade 12 (Life Role Competencies)

1. Aesthetics/Human Appreciation
2. Civic and Social Responsibility
3. Employment Skills
4. Personal and Family Management

The Department has published a series of booklets (see *References* for list) which describe fully the competencies within each skill area, including the set of competencies which the state considers to be minimum requirements and the set of competencies which are the basis for the testing program.

The competencies which have provided the basis for the reading and mathematics test items for MEAP are a subset of the complete set of "minimum performance objectives" for their respective subjects and have been systematically selected and subjected to extensive review. Table 2 lists the specific skill areas within reading and mathematics for which objectives have been developed (*Alternative Forms*, p. 18). These objectives make up the official competencies in which every fourth- and seventh-grade pupil is tested.

Virginia

The State of Virginia has two separate testing programs at different grade levels: (1) the *Graduation Competency Testing Program* at the secondary level and (2) the *Basic Learning Skills Program* at the elementary level. Both of these programs have been developed to assess minimum competencies.

The graduation competency tests focus only on the subject areas of reading and mathematics. Since January 1981, students have been required to pass these tests in order to receive a diploma from an accredited high school. An analysis of test results will facilitate diagnosis and remediation for students who fail to achieve the necessary standards and will also assist in the revising and improvement of both curricula and instruction.

The basic learning skills tests, to be administered each year in grades 1 through 6, will include criterion-based tests in reading, mathematics, and communication arts. They are designed to enable elementary students to acquire a mastery of the basic skills considered necessary for success in high school.

The statewide Graduation Competency Testing Program at the high school level assesses both school and life application skills within the domains of reading and mathematics. Specific competencies were identified by statewide committees of educators, legislators, members of the business community, and the general public. They were approved by the State Board of Education in 1978 and are listed in Table 3. Local school districts are mandated by law to develop (or select) and administer some kind of assessment in citizenship/social studies and the degree to which the student is prepared for further education and employment. This assessment may include or consist of only formal testing, but local school districts are permitted to adminster nonformal methods of assessment.

The instructional objectives for the Basic Learning Skills Program were initially written by the Division of Elementary Education within the Department of Education. They were then validated by public school district personnel and representatives of institutes of higher learning and were finally approved by the Board of Education in 1977. The primary objectives for the three skill areas are displayed in Table 4. (The state has also identified *enabling* objectives which further define, at the appropriate grade level, each of the objectives listed in the table.)

In addition to the graduation competency and basic learning skills tests, each school district must administer normative tests annually to groups of students selected by the Department of Education. These tests must be developed (or selected) and scored by the Department. Currently, Science Research Associates tests are being administered to every student at grade levels 4, 8, and 11.

Massachusetts

Minimum competency testing in Massachusetts was mandated in late 1978 by the State Board of Education in the form of a basic skills improvement program. The main purpose of the program is to aid students in achieving mastery of certain basic skills before graduation from high school. Graduation is not, however, contingent upon passing the basic skills test. Diagnosis and follow-up of learning problems constitute the major emphases of the program, and local district involvement and responsibility in the program implementation and maintenance is high.

Table 2
Skill Areas Tested by the Michigan Educational Assessment Program

Reading, Grades 4 and 7	*Mathematics, Grade 4*	*Mathematics, Grade 7*
Vocabulary meaning	Pre-number	Numeration
Literal comprehension	Numeration	Whole-number addition and subtraction
Inferential comprehension	Whole-number addition and subtraction	Whole-number division
Study skills	Non-geometric measurement	Fractions
		Decimals
		Ratio and proportion
		Measurement
		Geometry
		Algebra
		Metric

The state requires that student achievement of minimum standards in reading, writing, listening, speaking, and mathematics be assessed at least once at each of three levels: early elementary (grades K-3), later elementary (grades 4-6), and secondary (grades 7-12). The first testing at the secondary level must occur no later than the ninth grade. The State has developed mandatory skills statements in all five mandated skill areas at the secondary level and optional tests in reading, writing, and mathematics at the secondary level.

Table 3
Graduation Competencies for Reading and Mathematics

Reading Skills

1. The student will locate specific information contained in printed materials.
2. The student will read and demonstrate an understanding of written materials.

Mathematics Skills

1. Read and write numerals
2. Compare numerical values
3. Add, subtract, and multiply whole numbers
4. Add, subtract, and multiply decimal fractions
5. Multiply simple fractions
6. Express percents as decimals
7. Express fractions as decimals
8. Find a given percent of a number
9. Draw conclusions from graphs
10. Determine distance from a map
11. Read tax, interest, and insurance tables
12. Know concept of parallelism and parts of circle
13. Determine perimeter and area — rectangle
14. Know measurement units, determine elapsed time
15. Solve practical problems in personal finance

Source: General Assembly of Virginia. *Standards of Quality for Public Schools in Virginia.* Enacted 1978 for the 1978-80 biennium, p. 16.

Secondary goals of the program include (1) the establishment of clear standards of achievement, evaluation, and reporting to the public and (2) the expectation that individual districts will take a careful look at their current instructional practices in light of these standards, since regular instructional programs should ensure student mastery of basic skills. Specific purposes of the program, then, include early diagnosis of student learning problems, curriculum modification as necessary to ensure learning of basic skills, and reporting test results to the public.

Initially, basic life skills were the focus of concern, but as investigation progressed, this focus broadened to include an emphasis on basic academic skills. The five competency areas mandated — reading, mathematics, writing, listening, and speaking — reflect the current mixture of emphasis on academic and life skills and were determined following public hearings and a public survey conducted by an outside agency. The Advisory Committee on Basic Skills Improvement (formerly called the Advisory Committee on High School Graduation) then made recommendations to the State Department of Education and Board of Education; these recommendations were approved.

In order to develop specific skill statements defining each broad competency area at the secondary level, the Advisory Committee requested the establishment of two task forces — one to focus on mathematics and one on communications. Members of each task force were teachers who were content specialists in the appropriate field, bilingual educators, guidance counselors, school administrators, and representatives of special projects and affiliated associations. The Communications Task Force was further divided into three committees — one committee for reading, one for writing, and one for listening and speaking.

The task forces developed skills statements at the secondary level which were subsequently approved by the Department and adopted by the Board. Table 5 presents the subskills that were defined for each competency area. For the complete text of the objectives listed under each subskill, see the regulations (Massachusetts Department of Education, 1979).

Table 4
Minimum Statewide Educational Objectives for the Basic Learning Skills Program: Reading, Communications, Mathematics (Grades K-6)

Reading

1. The student will identify words encountered in written or oral form.
2. The student will use structural analysis and context clues to identify words.
3. The student will identify antonyms, synonyms, homonyms, and homographs, and demonstrate a knowledge of their meanings.
4. The student will identify the main idea in a reading selection.
5. The student will arrange events in sequence from a reading selection.
6. The student will classify items or events.
7. The student will predict outcomes from a reading selection.
8. The student will locate and verify factual information on who, what, when, where, or why in a reading selection.
9. The student will distinguish fact, fiction, and opinion in a reading selection.
10. The student will determine cause-and-effect relationships.
11. The student will determine the meaning of words from context clues.
12. The student will follow oral or written directions.
13. The student will locate information.
14. The student will organize information.

Communications

1. The student will comprehend main idea(s) and specific detail(s) of an oral communication.
2. The student will comprehend that the meaning of an oral communication is influenced by many factors.
3. The student will use correct and appropriate language.
4. The student will speak effectively in a variety of situations.
5. The student will write legibly and correctly to convey information and ideas.

Mathematics

1. The student will identify the place value of each digit in a ten-digit numeral.
2. The student will identify the relationship between two six-digit numerals as greater than, less than, or equal to.
3. The student will add two five-digit numerals with regrouping.
4. The student will subtract a five-digit numeral from a greater five-digit numeral with regrouping.
5. The student will multiply a three-digit numeral by a two-digit numeral with regrouping.
6. The student will divide a four-digit numeral by a two-digit numeral with a remainder.
7. The student will identify the relationship between two fractions (halves, thirds, fourths) as greater than, less than, or equal to.
8. The student will add and subtract fractions and mixed numbers.
9. The student will identify the place value of each digit in a decimal fraction, through thousandths.
10. The student will add and subtract decimal fractions, through thousandths.
11. The student will multiply and divide decimal fractions, through thousandths, by a one-digit numeral.
12. The student will demonstrate competency in measurement, using metric and customary units of measurement.
13. The student will demonstrate an understanding of geometric shapes and their properties.
14. The student will interpret line graphs, tables, and charts.

Source: General Assembly of Virginia. *Standards of Quality for Public Schools in Virginia.* Enacted 1976 for the 1976-78 biennium, pp. 19-20.

Table 5
Subskills Defined for Each Competency Area at the Secondary Level

Reading

1. Basic word meaning
2. Literal comprehension
3. Interpretive comprehension
4. Evaluative comprehension
5. Locating information

Writing

Given the opportunity to use a dictionary, students, through their own writing samples, will demonstrate:

1. Knowledge of the subject
2. Clear and consistent purpose
3. Organization
4. An awareness of the intended reader
5. Precise word choices
6. Fulfillment of the purpose
7. Correct capitalization and punctuation
8. Correct spelling
9. Legible handwriting
10. Complete sentences
11. Standard use of nouns, pronouns, verbs, adjectives, and adverbs
12. Agreement of subject and verb

Listening

1. Basic listening skills
2. Understanding what you hear
3. Using what you hear

Speaking

1. Basic oral communication skills
2. Planning, developing, and stating spoken messages
3. Common uses of spoken messages

Mathematics

1. Number and numeration concepts
2. Arithmetic computation
3. Estimation and approximation
4. Measurement and geometry
5. Graphs and tables
6. Prediction of events and statistics

Source: Massachusetts Department of Education. *Basic Skills Improvement Policy and Regulations.* Boston, Massachusetts: Alfred C. Holland, State Purchasing Agent, 1979, pp. 3-6.

New York

The state of New York's minimum competency testing program formerly comprised six separate components, each using different sets of tests. However, the program was revised to include only five components after January 1981. First, a new set of Regents competency tests in reading comprehension, writing, and mathematics has been developed for administration in high school; these tests are now being phased in and will serve as both the core of New York's minimum competency testing program and a partial requirement for a high school diploma. Second, a passing score in an end-of-course Regents examination in eleventh-grade English or in any high school mathematics course may be substituted for the related Regents competency test. Third, a satisfactory score on one or two standardized college admission examinations in the appropriate subject area may be substituted for the corresponding Regents competency test. Fourth, the "basic competency tests" in reading, writing, mathematics, science, and social studies, which were developed in the early 1970s, had been used as a partial requirement for a high school diploma

Table 6
Specific Competencies in Three Content Areas Required for High School Graduation

Reading Comprehension

Students will be able to demonstrate a satisfactory level of reading comprehension by selecting words for insertion into a prose passage, thereby showing their

1. Understanding of the meaning within individual sentences
2. Ability to derive meaning from connected prose text

Writing

Students will be able to demonstrate a satisfactory level of language skills by writing

1. A business letter
2. A report based upon data supplied
3. A statement of about 200 words designed to persuade a specific audience

Mathematics

Students will be able to demonstrate a satisfactory level of mathematics skills by answering questions involving

1. Integers
2. Rational numbers
3. Graphing
4. Geometric figures
5. Ratio, proportion, and percent
6. Probability and statistics
7. Consumer and job-related mathematics

Source: New York State Department of Education. *The Regents Competency Testing Program: Competency Testing, Remedial Instruction, and High School Credentials.* Albany, New York: 1979, pp. 9-10.

but were phased out entirely in 1981. Early identification of pupils who appear to need remediation in order to successfully pass the Regents competency tests has been designed into the testing program. Fifth, Pupil Evaluation Program (PEP) tests are administered to all students in grades 3 and 6 with an optional additional administration in grade 9; these tests are designed to measure reading and mathematics skills and to provide diagnostic information about elementary school students. Sixth, in reading comprehension and writing, preliminary Regents competency tests which are comparable to Regents competency tests have also been developed. Students in grades 8 and 9 must be administered these tests for diagnostic purposes, if they have not met the state-specified performance on the PEP tests in sixth grade or on a nationally standardized achievement test in grades 8 or 9.

The basic philosophical position of New York's Board of Regents is that "one of the most important responsibilities of the elementary and secondary schools is . . . teaching young people to read with comprehension, to write effectively, and to make proper use of mathematical concepts and operations" (New York State Department of Education, 1979, p. 1). This philosophy pervades all of the work associated with the development of the new Regents competency testing program and the integration of this program with existing testing and examination components.

The specific goals of New York's overall minimum competency testing program are twofold: "to assure the early identification of students who need special help in developing ... skills" and "to assure that students have acquired an adequate competence in these skills before receiving a high school diploma" (New York State Department of Education, 1979, p. 1). The new preliminary Regents competency tests and the existing PEP tests represent approaches to the diagnostic goal, while the new Regents competency tests themselves represent the major approach to the goal of proficiency required for a high school diploma.

Table 6 indicates the specific competencies in three content areas required for graduation. These competencies are assessed by the new Regents competency tests.

Summary

It has been the intent of this paper to point out differences and similarities in a small sample of existing or developing state programs and to provide specific examples from the states selected of what has been and is being accomplished in the area of basic skills/minimum competency testing. This, together with background information regarding the development of these programs, has been presented in order to give some impression of the broad range of available options in this field.

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Literacy is Rising, But So Is Demand for Literacy

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Editors' Note: *Reports in the public media have indicated that students are not learning as well as students did in the past. Those reports have contributed in some communities to a crisis attitude in basic skills planning. In this paper John Bormuth summarizes his analysis of several apparently discouraging studies of levels of literacy. He concludes that there is no evidence for a decline in literacy. In fact, there is evidence that literacy in the total population is rising. Bormuth suggests that there is no reason for panic and that attempts at quick changes in schools, especially an emphasis on simpler skills, may be counterproductive. He also suggests that literacy is increasingly important for success in our society and that we must use greater care in assessment of literacy and provide for long-term, close attention to improving literacy instruction for all students.*

People are confused about the nation's level of literacy, and with good reason. Daily, the news media report expert opinions and test scores claiming that the literacy levels of youth in our country are falling, that adult illiteracy is rampant, and that electronic media are making the written word obsolete. Yet, the fact that people can observe that we are making more use of our literacy for more important purposes than ever before would seem to suggest just the opposite. What should be done? Should we beat down the schoolhouse door, throw out the teachers and the books, and mount massive adult literacy programs? Or should we send up a great cheer and announce that the war is won?

Neither. As we shall see, people's own observations, and not those of the experts, are the best indicator of the state of our nation's level of literacy. In fact, the level is generally high, and literacy is a growing force in our economy. But there *is* a true cause for alarm. It is clear that the experts do not know how to define literacy, or how to assess it, and they have not known where literacy has been headed. They have not even been asking the right questions! Instead of asking, How literate are we? they should first have asked, How do we find out how literate we are? Only then can they address the questions, How literate should we be? and, How can we best reach that level of literacy?

This brief essay cannot answer these questions. But we will try to show that they are the primary issues in literacy policy. First, we will identify major flaws in the literacy assessment studies reported in the news. Next, we will examine strong economic trends showing that literacy is an increasingly important force in our country's economy. These discussions will lead to our conclusion that the demand for higher levels of literacy is increasing and spreading to a broader segment of the population.

News Reports of Literacy Assessments

Literacy assessment is not an organized science. It has neither a group of scholars dedicated to its study nor a journal where those studies are systematically reviewed and reported. Instead, the studies are described in unpublished technical reports and publicized in the form of brief news releases. Since the press has little interest in publishing positive results and little knowledge or sophistication in research methods, the public hears only the darkest results and none of the qualifications that moderate and even refute those conclusions.

. . . people's own observations, and not those of the experts, are the best indicator of the state of our nation's level of literacy. In fact, the level is generally high, and literacy is a growing force in our economy.

Literacy of youth. First, consider the claims reported in the press that the literacy of youth is falling. Such claims are usually based on studies of the scores that students have made on one of the commercial reading tests used routinely by schools. The people who conduct these studies usually give one of these tests to a group of students and then return some years later to give the same test to students at the same age or grade level who are now enrolled in the same schools. Farr, Tuinman, and Rowls (1974) and Harnishfeger and Wiley (1975) searched out these studies and reviewed all that they could find. Their conclusions (which appeared in the news) were that the average scores for all students rose steadily until 1965. Thereafter, the averages of elementary students continued to rise but at a slower rate; the averages of junior high school students leveled off or dropped slightly; and the averages of high school students began a slow but definite decline. What the news did not report was that the reviewers found so many serious flaws in these studies that they placed little faith in their own conclusions.

The list of flaws in literacy assessment is too long and complicated to give here. But at least the most serious and consistent flaw should be described. In order to compare the reading skills of two groups of students, researchers have not only to administer the same test to both groups of students but also to insure that very similar groups of students are given the tests. To claim that reading skills have fallen over time, both of these conditions must be met. It is not difficult to meet the first condition, but the second condition is nearly impossible to meet. School populations change constantly as a result both of shifts in government policies and of changes in the kinds of families who have children attending the school.

One historical change in government policy alone could have resulted in the *appearance* of falling reading scores, even though the reading skills of youth were actually continuing on their previous upward trend. During the early part of the 1960s, schools mounted vigorous campaigns to prevent students from dropping out of school before they graduated. The direct result of this policy change, which is shown in panel A of Figure 1, was reported in the *Digest of Educational Statistics* (1962-), which is published by the Department of Education. Over ten years, the dropout rate was cut to about a fourth of its former level.

In addition, this particular policy produced at least two indirect results. It began to lower the average IQ scores of the students who were enrolled in schools. A study by the Bureau of Labor Statistics (1960) showed that the former dropouts generally had much lower IQs than the students who had been staying in schools. These figures are shown in panel B of Figure 1.

There is a high correlation between students' IQs and their ability to learn reading skills. Therefore, it may safely be assumed that the second indirect effect would be a decrease in reading scores like the one researchers reported. Since only a few elementary school students have dropped out of school in the past, the return of those students to school would be expected to produce a relatively small decrease in gains on reading tests. This was what researchers found had happened. Next, since the dropout rate rises at the junior high school level, those average scores would be expected to level off more or decline a bit, just as they did. And since the dropout rate is highest in the high schools, those averages would be expected to show a definite decline, just as they did. Thus, the reading skills of *all* youth may actually have been continuing on their upward trend throughout this period when the average test scores were declining.

Now this does not prove that reading skills of youth did in fact continue on their previous upward trend. (It shows clearly the danger of comparing dissimilar groups.) The available studies, in fact, *do not tell us what actually happened* to the reading skills of youth during this period of time.

Literacy of Young Adults. The press is also fond of reports that the literacy of college students and recent graduates is declining. Some of these reports are based on students' scores on college entrance examinations, while others are based on the statements of professors and employers who complain that students and recent graduates do not read and write as well as earlier ones. There is little reason to doubt that the average performance of college students and recent graduates has fallen. But, once again the observers are trying to compare groups that have changed in composition.

First, consider the college examiners and professors. Thirty years ago, they saw only the brightest high school graduates. In 1946, only 13 percent of the 18-24 year olds were enrolled in college, according to the *Digest of Educational Statistics* (Department of Health, Education, and Welfare, 1962-). So the professors and examiners were then dealing almost entirely with the academic elite. However, the percentage of youth enrolled in college rose rapidly over the next generation, reaching 34 percent by 1974. The professors were by then seeing more students with only modest intellectual abilities. And the performance of these students was probably below the standards set by earlier, generally more able groups of students. But that did not indicate that the literacy of all young adults was falling. To the contrary, many more young adults were now receiving much more education than before. So the literacy of young adults may in fact have surged upward during this period.

Much the same kind of thing happened to employers. They rarely if ever complain about the literacy of skilled and unskilled laborers.

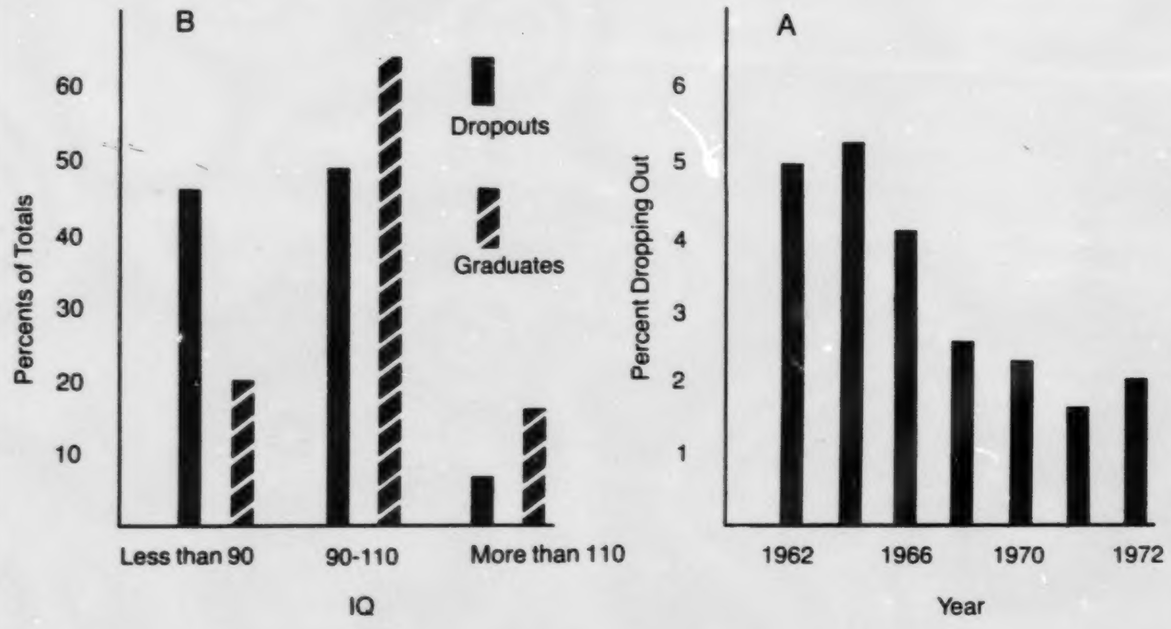

Figure 1. Percent of Students Dropping Out of School from 1962-1972 and Average IQ's of Dropouts and Graduates

Instead, they speak of the reading and writing skills of white-collar workers whose jobs depend heavily on those skills. In 1946, according to the *Statistical Abstracts of the United States* (Bureau of the Census, Annually), less than 36 percent of the labor force was employed in white-collar occupations. During the next few decades, the nation's standard of living rose rapidly, caused largely by the fact that industries employed increasingly advanced technology and grew large enough to enjoy more of the economies of production that come with size. This growth and increase in complexity meant that increasing numbers of people had to be hired in managerial, professional, technical, and clerical roles. By 1974, the number of white-collar workers had risen to 48 percent of the labor force.

To fill that many jobs, employers had to hire more people with lesser intellectual abilities than many of the bright people who had easily gotten those jobs in the past. So, like college professors and examiners, when employers complain about literacy skills, they are not reporting on the literacy trends of all young adults. Rather, they are telling us that when they have to hire more people who did not learn to read and write well in school, these people also do not read and write well at work. That may, in itself, qualify as alarming news. But it does not mean that the literacy of all young adults is falling.

People are literate when they can exchange as much information as they want or need using the written word. So their literacy can be measured directly only by testing their ability to comprehend materials that they actually need to read in their day-to-day lives or materials they want to read.

The most serious faults in the studies described up to this point stem from the fact that they did not measure literacy itself. People are literate when they can exchange as much information as they want or need using the written word. So their literacy can be measured directly only by testing their ability to comprehend materials that they actually need to read in their day-to-day lives or materials they want to read. Instead of measuring literacy directly using tests that have students reading many different but relevant materials, many of these studies tried to measure literacy indirectly using people's scores on some single test of their reading skills. A reader's score on one of these comprehension tests directly measures *only* his or her literacy with respect to the particular material tested.

People's literacy *can* be inferred using their scores on a test of reading and writing skills. But doing so with accuracy requires other evidence, such as knowledge of the level of difficulty of the materials which the person taking the test *needs* to read in daily life. It is possible that reading scores could go up and literacy levels still fall if the materials encountered in day-to-day living, particularly at work, were more demanding than the material on the tests. At present, we have no data on the possible increase or decrease in the demands of reading material over time.

Once again, nothing that was said here proves that people's literacy is rising, falling, or stable. What it does show is that the studies described up to this point provide very weak and possibly misleading evidence about the trend of literacy among youth and young adults.

Literacy of Adults. For almost two centuries, the Bureau of the Census has counted the adults in this nation who say that they are illiterate. According to the Bureau of the Census (1975), the number of illiterate adults has steadily declined, until it now stands near 1 percent of the population. Recently, the news media have reported a number of studies that tested adults' mastery of such useful reading tasks as the ability to comprehend forms and directions on packages (Harris and Associates, 1970; Murphy, 1973, 1975; Northcutt, 1975). Those adults were counted as being illiterate who failed to answer as many questions as the researchers thought they should. Illiteracy rates of 10-20 percent were reported for all adults, and illiteracy rates of 5-11 percent were reported for college graduates and professional and managerial workers.

The most serious flaw in these studies was that researchers could offer no explanations for why they set the cut-off scores so high. Donald Fisher (1978, 1979) doubted that any college graduate or managerial or professional worker was illiterate. So he used the "illiteracy rates" of these groups as an estimate of how much too high the cut-off scores were for the total population of adults. When he recalculated the rates given in the studies to remove this bias, the illiteracy rates for all adults fell to 1-7 percent. Then he noted that most of the errors had been made on a small number of questions. When he systematically examined some of these, he found that most of the errors were caused by failure to comprehend the questions being asked rather than by failure to comprehend the materials that were supposedly being tested.

Thus, it seems probable that the adult illiteracy rate is about 1 percent, as the Bureau of the Census says it is, and that it is found almost entirely among the blind, the severely mentally retarded, the very old, and non-English-speaking immigrants. But this does not prove that the literacy level is stable or rising. As most people use the term, to be *illiterate* means to have a useless level of ability to use the written word. But to be *literate* does not mean simply to have a next-to-useless level of ability to read and write. There are many levels of literacy; for example, there is a broad, gray region of "subliteracy" which separates the illiterate from the literate. There are also, of course, many higher levels of literacy.

In the final analysis, the test data can neither support nor refute propositions that the level of literacy in our nation is high or low, rising or falling. This analysis of studies which report test results does appear to refute the claim that adult illiteracy is rampant, however. It also suggests that literacy testing and literacy assessment are primitive arts. The studies discussed ignored critical factors, and the results reported have confused and misled even the experts and the best informed policy makers.

Economic Indications of Literacy

Fortunately, people have not had to rely entirely on reports based on literacy tests. When they see people reading, they are seeing the evidence of literacy itself. And when they see materials being manufactured and distributed and students being taught to read and write, they are seeing the activities needed to make that literacy possible.

Literacy has often been made to seem economically unimportant. It is described as an educational concern, as an aesthetic endeavor, as a matter of social equity, or as a necessity of democratic government. Clearly literacy is far more than any or all of these things — it plays a vital role in our economy, too. Information is our most important resource. Advances in technology and increases in the complexity of community organization have made the communication of that information a larger and more important task. Though other media have provided some help, the written word has carried a large, important, and rapidly increasing load.

The author of this paper published a study (1978) that attempted to gather a comprehensive set of economic data related to literacy. It covered selected years from 1947 through 1972. (The years considered were those for which reasonably complete data were available — the years in which the Census of Manufacturers was conducted by the Bureau of the Census.) Whenever possible, the study examined measures of actual events and objects, such as time spent reading and writing on the job or the number of books published. Then, to provide a comprehensive view of the trend of activities related to literacy, expenditures for all of these variables were totaled. To ensure that those trends were real, all data were expressed in dollars on a per person basis, and the dollar figures were corrected for inflation by converting them to 1976 dollars.

The dollar amounts are summarized in Table 1. The first three lines show the amounts spent for activities and materials related to literacy, and the fourth line shows the amounts spent for reading and writing on the job. The fifth line shows the totals of these expenditures, and the last two lines express the amounts on a per person basis and as a percentage of the gross national product (GNP), a measure of the value of the goods and services that the nation produces during a given year. The column at the far right shows the rate of increase of the figures in each row. (Rates are annually compounded, to be conservative.) Note that every category of ex-

Table 1
Expenditures Related to Literacy*

Item	1947	1954	1958	1963	1967	1972	Annual percentage increase
	Amounts by Year (in billions of dollars)						
Materials and supplies	10.1	11.4	12.6	15.0	18.0	20.0	2.8
Distribution of materials	3.7	4.3	4.8	7.2	8.8	11.4	4.6
Instruction in literacy skills	4.9	9.6	12.5	16.5	22.1	28.2	7.2
Reading and writing at work	119.7	148.4	174.2	213.0	289.7	347.4	4.4
Total	138.4	173.7	204.1	251.7	338.6	407.0	4.4
Dollars per person	961	1070	1172	1330	1704	1949	2.9
Percent of the GNP	21	22	24	24	26	26	1.0

*All figures are corrected for inflation by conversion to 1976 dollars.

penditure grew faster than the population (which increased at an annual rate of 1.5 percent during this period), faster than the gross national product, and even faster than inflation.

To a large extent, the increase in materials and supplies was due to a rise in the number of books sold (from 6.8 to 8.6 per person), and to a rise in the number of newspaper pages published daily (from 13 to 20 per person). No record seems to have been kept of the numbers of periodicals and other publications published throughout this period or of the numbers of pencils, sheets of writing paper, or other supplies sold. However, it could be determined that the total expenditures for these items rose from $26 to $33 per person. Also, no accounting could be made for the number of typewriters, copy machines, computers, and similar equipment. However, observation indicates that expenditures for them grew at much faster rates than expenditures for the items that were accounted for.

Expenditures for distributing materials rose at an annual rate of 4.6 percent, from $3.7 billion in 1947 to $11.4 billion in 1972. This was partially due to a 60 percent increase in the total number of public libraries, whose overall collections tripled and whose circulations rose from 2.5 to 4.4 items per person annually. The rise in distribution figures was also influenced by the fact that mail delivered rose from 297 to 418 pieces per person annually and that expenditures for telegraphy rose from $4.48 to $5.16 per person. These figures do not account for the growth in the number and sizes of private and industrial libraries or for the increase in the amount of information distributed in the form of printing on packages (or for the many other means of distributing printed information). But, once again, it seems likely that expenditures for the activities not accounted for were growing at least as fast as those that could be accounted for.

Estimated expenditures for instruction in literacy skills rose from $4.9 to $28.2 billion, at the astounding annual rate of 7.2 percent. Much of this rise was a response to the baby boom, some was a result of the rise in the days of instruction per year from 137 to 157 days per student, and some occurred because of an increase in the number of teachers per student.

The largest item among the four categories was for reading and writing at work (calculated from wages paid for such work). Growth in this category was caused by an increase in the size of the white-collar work force, which grew from 37 to 48 percent of the total work force in the period 1947–1972. In 1971, reading and writing consumed 141 minutes, or 29 percent, of the average employed person's work day (Sharon, 1972). Over the whole period studied, the estimated expenditures rose from about $120 billion to over $347 billion. No formal effort was made to set a value on the time that people spend reading and writing outside of work. However, rising expenditures for books, magazines, and newspapers make it seem likely that any such estimates would have kept pace with those for reading and writing at work.

When the expenditures for these four categories were totaled, those totals rose from $138.4 billion to $407 billion, at an annual rate of 4.4 percent. Total expenditures per person for these literacy-related activities rose from $961 to $1,949, at an annual rate of 2.9 percent. And total expenditures for literacy rose faster than the gross national product, rising from 21 to 26 percent of that figure.

These totals do not include expenditures for many other items relevant to trends in literacy, some of which were too complex to be included. But the items omitted would have increased the totals shown and would probably have grown as fast or faster than the items that have been discussed here.

Conclusions

The first conclusion that can be drawn from these figures is that literacy is very important in our society. By 1972, the total expenditure for literacy-related items and activities reached $407 billion, over one fourth of the gross national product, 1.13 times the size of all federal expenditures, over twice the size of the defense budget, and 5.8 times the total the nation spent for new and used cars during that year. These data make it clear that literacy has become a major economic force in this country.

Second, in view of the higher percentage of students staying in school and the higher percentage of workers in white-collar jobs, creating a demand for higher levels of literacy over a broader portion of the population, the level of literacy of the population as a whole may very well be rising. Analyses of the test data certainly do not indicate that a panic over illiteracy is justified.

Third, people want to be literate, not merely more literate than they were before. To most people, being literate means to be able to comprehend or write competently materials that they realistically want or need to read or write. Having less ability than that forces them and society to forgo important opportunities. Because the media usually report scores on reading tests as indicators of literacy, they tend to focus on reading skills with no attention to the difficulty of the material people want or need to read.

Fourth, studies on literacy should first ask how we ought to go about finding out if a person is literate. Thereafter, the issue is not whether people are growing more or less literate. The central issues are whether people are as literate as they need to be and how to identify the best course of action for making and keeping them this literate.

Clearly, our bed and board depend heavily on how well we can use the written word. Tests may not yet be able to tell us whether we can use it as well as we should. But economic data give us important parts of the answer. People are making more use of literacy for more important purposes. They could not be doing this unless schools had been steadily raising more people to steadily higher levels of literacy. But is that enough? The trend is pointing steeply upward into a future where even more people must reach even higher levels of literacy. To arrive at that future, schools will need a lot of help. It will not be enough merely to provide more of the same instruction as before. The instruction will have to become even more productive. The papers in this handbook are efforts to achieve that productivity.

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